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CLASSROOM EXPERIENCE INITIATED PRIOR TO METHODS INSTRUCTION AND STUDENT TEACHING WAS STUDIED TO DETERMINE IF MEASURABLE TRANSFER EXISTED BETWEEN THEM. FORTY ELEMENTARY TEACHER CANDIDATES WHO HAD COMPLETED THEIR JUNIOR YEAR COMPRISED THE POPULATION. THE EXPERIMENTAL GROUP (20) PARTICIPATED IN A 6-WEEK SUMMER SESSION PROGRAM OF TEACHING SMALL GROUPS OF CHILDREN READING AND ARITHMETIC. THE CONTROL GROUP (20) WERE MATCHED TO THE EXPERIMENTAL GROUP ON GENERAL ABILITY AND SPECIFIC ACHIEVEMENT. THE GENERAL DESIGN OF THIS STUDY USED A CONTROL GROUP AND ONLY A POST-TEST. HOWEVER, BOTH PRE- AND POST-TESTS WERE USED TO MEASURE PERSONALITY CHANGES. IT WAS FOUND THAT AN INDEPENDENT EXPERIENCE WITH CHILDREN IN A CLASSROOM SITUATION SIGNIFICANTLY REDUCED THE ANXIETIES OF THOSE WHO WERE ENTERING STUDENT TEACHING. IN THE SUBSEQUENT METHODS, THOSE WHO HAD THE TEACHING EXPERIENCE MANIFESTED GREATER COMPETENCY FOR THE ENTIRE SEMESTER. REPLICATION WAS SUGGESTED ON A LARGER SCALE WITH A MORE DIVERSE-BACKGROUND POPULATION FROM DIFFERENT LOCALES. (RS)

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TRANSFER EFFECTS OF DIRECTED CLASSROOM EXPERIENCE TO AN ELEMENTARY METHODS CLASS AND STUDENT TEACHING

by

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Although the students who constituted the experimental group were unaware of their status as experimental subjects, they must also be commended for the summer of arduous work which formed the basis of the experiment. Likewise, the assistance of Lily Pai in typing and proofreading deserves public acknowledgement. Finally, tribute should be given to the other members of the faculty of Marygrove College who bore with the author's almost total absorption in this work and who often had to assume some of her local college duties.

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CHAPTER I

INTRODUCTION

In the last several years the burgeoning interest of both professional and lay groups in quality of education has become focused to a great extent on quality in teaching. Thus whole new areas of scholarship and research are opening up in a current endeavor to develop a theory of teaching. Such theory-making will inevitably have an almost revolutionary influence on patterns and forms of teacher education. N. L. Gage, when speaking of a framework for research on teacher education, expresses the path of this influence very simply: "I regard research on teacher education as a branch of research on teaching."[1] The Panel on Educational Research and Development of the President's Science Advisory Committee is even more direct in attempting to channel the present concern about education into constructive concern about teacher education: "The members of the Panel and many other people as well, agree that there is no more important prerequisite for improving the educational system than improving the preparation of teachers."[2]

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[1] N. L. Gage, "Psychological Research on Teacher Education for the Great Cities," Research Seminar on Teacher Education (Washington, D. C.: Cooperative Research Project No. G-011, U. S. Department of Health, Education and Welfare, 1963), p. 43.

[2] Panel on Educational Research and Development, Innovation and Experiment in Education (Washington, D. C.: U. S. Government Printing Office, 1964), p. 23.

Any theory of teaching or of teacher education, however, must be based on research as well as on conceptualization. Experimentation with various types of teacher preparation and their potential to produce effective teachers is fundamental to the implementation and verification of conceptual frameworks for educational patterns. And, although experimentation of this nature is needed, it is not always feasible in many teacher training institutions:

> Research concerning the effectiveness of teacher education programs has been confined largely to questionnaire and opinionnaire surveys. Variables in such domains as personality, curriculum, and methods continue to defy satisfactory control and measurement. This lack of control may explain the reluctance for experimentation in teacher education.[1]

Furthermore, all areas and all factors of teacher education cannot be explored at once. Yet every modern conceptual framework for teacher training, includes laboratory experiences, at least in the form of directed teaching. And, even the most severe critics of present pre-service teacher programs, recognize the importance of such experiences. The relationships, therefore, of various types of laboratory experiences to the college theory-training sequences, and the relationships of these theory courses to success in teaching would seem to be the logical starting point for empirical investigation.

An apparent lack of articulation between those same college courses and the work of the student teachers in their directed teaching experiences seems to form the basis for one of the major complaints of college supervisors. There are many factors which could be contributive to such a disturbing student teacher phenomenon: growing demands on the student teacher from both the college and the classroom standpoints; explosion of knowledge and the need for greater technological know-how; and an expanding difference between their own elementary school memories and the present reality of changing curriculum, changing methods, and changing type of pupil population.

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[1] Harold E. Reynard, "Pre-service and In-Service Education of Teachers," Review of Educational Research, XXXIII (October, 1963), p. 370.

Thus, during their directed teaching, students often seek help, or fail to seek help, in the understanding and application of those very principles which were expressly developed in their preceding methods course. Background knowledge, lesson planning, motivational procedures studied as such before any form of student teaching seem highly theoretical to the education student even when supplemented by classroom observation.

Statement of the Problem

It seemed, therefore, that an actual session of classroom teaching supervised in such a way that the children could benefit as well as the education students, would provide an important readiness experience for an elementary school methods course and student teaching. This extended classroom encounter would thus be the means by which the elementary school candidates would come to feel a need for knowledge deeper than mere technique. Becoming sensitized to the reality of classroom problems, they would derive applicable meanings from their subsequent methods course and make more skillful use of these meanings in their student teaching. This study had for its main purpose, therefore, to determine whether measurable transfer exists between a less formal but directed classroom experience, initiated prior to an elementary methods course, and, achievement in the subsequent methods course and in student teaching.

Questions Proposed

Subordinate to this main purpose, but contributing to its totality, the following subpurposes were posited:

1. To determine whether, due to such an experience, there was any change in personality structure of the participants which would be more predictive of success in student teaching.
2. To investigate the possibility of any significant difference in number and degree of manifest pre-teaching anxieties between those who had had such an experience and those who had not.
3. To discover if the directed classroom experience made any significant difference in levels of achievement in the methods course between those who participated in the experience and those who did not.
4. To investigate the extent to which any such difference carried over into differing levels of competence in student teaching.

General Plan of Procedures

The project as it evolved called for a summer school session during which a group of elementary school candidates, constituting the experimental subjects, would teach small groups of children who needed help in either reading or arithmetic. Under very supportive supervision, though not on a one to one supervisory basis, these subjects would test the children initially and aid the supervisors in assigning the children to their respective groups. During the ensuing six weeks, the students would endeavor to help these otherwise normal children, make progress in their chosen subject matter for a daily two hour period. Besides being in close contact with their pupils and their supervisor, the students would be encouraged to meet and confer with the parents of the children.

Prior to this experience and near the close of the regular college semester in late May, tests of general ability, teaching aptitude and personality would be administered to the total elementary school teacher population who were in their third regular year of college. Besides the experimental subjects, a control group matched to the experimental group on the basis of general ability and school achievement would then be drawn from the elementary population. The control subjects would, likewise, have already had the same courses in introductory psychology, developmental and educational psychology, and foundations of education as would the experimental subjects.

At the end of the summer session the personality test would be re-administered to the experimental subjects for the purpose of measuring personality changes over the teaching period. Starting on the first of September all the elementary population would participate in a four hour a day concentrated course in Elementary School Methods, which course would gradually blend into the first student teaching contact. During that course, raw scores on objective type unit tests would be accumulated for purposes of assaying differing levels of achievement between the experimental and control groups. Furthermore, immediately before the first student teaching contact, a questionnaire probing pre-teaching anxieties would be administered to the total group in order to discover if the prior teaching experience had been a fear-diminishing factor in readiness for student teaching. At the end of each of the two directed teaching contacts, the sponsoring teachers would be asked to fill out a student-teacher rating scale for their particular student teacher. The ratings on this scale would not be used as a basis for grading the student teachers and the sponsoring teachers would be made aware of this fact by a covering letter. The results of these ratings would be used to investigate differing levels of teaching competence between the experimental and control groups.

In order that the children involved in the experimental teaching session obtain some benefit from the small group classes, a short series of brief, vicarious observations would be presented to the experimental subjects shortly before their summer teaching session. These indirect observations would be in the form of Audio-Slide presentations of a few sample classroom lessons.[1] To insure equality of learning experiences other than the proposed summer situation, the same series would be presented to the entire elementary population the following September during the methods course. For this second presentation, however, the experimental subjects would be excluded.

Significance of the Problem

The student teaching experience is the most expensive the most intensive, and probably the most important phase of any teacher education program, in terms of the student's future success in teaching and in terms of benefit to children. Yet, as Sarason takes a whole book to explain, the contents and procedures of teacher education frequently do not seem to have any demonstrable relevance to the actual day by day tasks of the average classroom.[1] In view then, of the present concern of all those who have any share in the training of teachers, for the future of education and the success of the individual teachers in the classroom, this study would seem to have relevance for those who have to make decisions as to the kinds of pre-teaching experiences which ought to be provided, and the chronological placement of such experiences. It should likewise be of interest to those who plan for or who teach methods courses to elementary school education students. It may even be of some help to members of colleges or departments of education who are currently seeking more integrated designs of teacher training. It is definitely of importance to the administration at Marygrove, the college in which the experiment has been conducted, to its faculty at large, and to the members of the education department in particular.

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[1] These audio-slides are obtained by synchronizing taped recordings of actual classroom procedures with colored slides of the lesson. For subject listing, see Appendix I, Exhibit A.

Review of Literature Related to the Central Problem

Many correlational studies have been conducted relating some student characteristic or some training factor to success in teaching. Most of this research has been concerned with: (1) personality factors and attitudes toward teaching, (2) ratings of college supervisors in comparison with ratings of first year principals or trained observers, and (3) scores on various intelligence, personality, or aptitude tests as related to success in teaching.[1] Few empirical studies can be found, however, with respect to placement of laboratory experiences in relation to success in methods courses as well as in student teaching.

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[1] Seymour B. Sarason, Kenneth Davidson, and Burton Blatt, The Preparation of Teachers: An Unstudied Problem in Education (New York: John Wiley and Sons, Inc., 1962)

Cynthia Colvin has explored a certain form of direct experience as readiness factor for student teaching itself.[2] Arrangements were made to enable each of twenty-one students to observe or participate at least one morning a week, as an individual rather than in a group, in the teaching-learning activities of a selected teacher and class. This directed observation was done in connection with the course Introduction to Teaching at Wayne State University. The students were evaluated in terms of pre and posttests on both the Juul adaptation of the How I Teach Inventory and a Draw-a-Teacher device, from diaries, instructor's ratings, and written and verbal comments of the principals and teachers involved. The outcomes, however, as outlined by the author tended to reflect growth in the cognitive realm rather than in the skills of teaching. Likewise, no attempt was made to test the transfer effects of the directed experiences on any subsequent professional course or on student teaching. Furthermore, the author herself states, "At no time was it expected that the study would establish the superiority of one type of program over another."[1]

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[1] Compiled from: N. L. Gage, Handbook of Research on Teaching (Chicago: Rand McNally and Co., 1963).

[2] Cynthia M. Colvin, "Achieving Readiness for Student Teaching through Direct Experience," (Unpublished Doctoral Dissertation, College of Education, Wayne State University, 1958).

Lewis B. Larkin, also working in cooperation with the College of Education of Wayne State University, explored types of field work experiences undertaken by students prior to their student teaching.[2] In connection with the required course, Recreational Leadership, 255 students, working under five widely differing agencies, each reported both a "negative" and a "positive" critical learning incident. These incidents were evaluated by each of three trained judges for allocation of the types of incidents to any of eighteen possible categories. Although the author established the value of positive experiences with both children and supervisors as a means of encouraging students to continue in the teacher education program, he urges that, "Some follow-up study might reveal whether or not any of the learnings in the field work program persisted into the classroom."[3]

Subjective evidence for a positive relationship between early experiences in the classroom and subsequent professional courses, is reported by Robert Hamilton from San Francisco State College. Working with twenty-seven students in a program which sought to help them become oriented to off-campus teaching situations, Hamilton made transcripts of hour-long interviews with the students after they had completed four to six weeks of their first term student teaching assignment. He reports, "All students who had elected to observe and participate in elementary school and classroom situations prior to student teaching, stated that they were very valuable experiences . . . the students thought that such experiences might well serve to give more meaning to the courses in professional education."[1] This author also urges an empirical investigation of the relationship of prior classroom experiences to success in any professional course which might follow.

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[1] *Ibid.*, p. 3.

[2] Lewis B. Larkin, "Field Work Experiences Prior to Student Teaching." (Unpublished Doctoral Dissertation, Department of Education, Wayne State University, 1963).

[3] *Ibid.*, p. 148.

All of these studies, however, although they emphasize from either a subjective or an empirical standpoint the value of directed laboratory experiences undertaken prior to student teaching, fail to take into account one of the strongest rationales for professional laboratory experiences. This is the rationale developed and explained by Charlotte W. Junge and Helen T. Suchara in The Outlook in Student Teaching. Both of these educators concur in speaking of the concept that should underly the totality of laboratory experiences as the "Theory-practice-theory cycle."[1] In a more explicit statement, Dr. Suchara says, "Thus, educational theory gives direction to practice and, in turn, classroom practice, carefully examined, gives rise to educational theory . . . .In a word, laboratory experiences need to be redesigned if students are to study, analyze, and interpret adequately the roles of knowledge and the process of learning in the education of children."[2] Dr. Junge explains further the theory of teaching as a creative application of basic educational theory, derived from an integration of both college lecture and laboratory proof, "The approach to learning for students of teaching should be experimental rather than authoritative and should recognize that students profit most from study of and participation in carefully controlled and, at times, atypical learning situations."[3]

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[1] Robert Glenn Hamilton, "Orientation of Student Teachers at San Francisco State College to Off-Campus Elementary School Teaching Situations," (Microfilmed Doctoral Dissertation, San Francisco State College, 1963), p. 247.

Following this structure Kropp and Anderson do report a study in which theory and practice were integrated thus: methods course - student teaching - methods course.[4] Using the Q-sort technique, but gathering data on only nine students, they concluded that interns teaching and studying in such an integrated manner, ". . . can do what they ideally would like to do in their student teaching experience."[1] Their main purpose was, however, to investigate the shaping of attitudes about teaching during the internship, and hence, they too were not concerned with the transfer effects of the theory - practice sessions upon each other in terms of achievement.

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[1] Charlotte W. Junge, Yvonne Lofthouse, and Helen T. Suchara, "A Rationale for Professional Experiences," The Outlook in Student Teaching, Forty-First Yearbook of the Association for Student Teaching (Dubuque, Iowa: Wm. C. Brown Co., Inc., 1962) pp. 136 - 151.

[2] *Ibid.*, pp. 136 - 137.

[3] *Ibid.*, p. 151.

[4] Russell P. Kropp and John E. Anderson, "Teacher Roles Before and After Internship," Journal of Educational Research L (March, 1963), pp. 366 - 369.

Based, nevertheless, on the findings of these studies, the present experiment has been designed to investigate the extent to which an actual teaching experience, initiated after basic courses in both psychology and foundations of education, but prior to an elementary methods course, will help students realize their needs, set realistic goals about learning to teach, and seek to attain these goals in their student teaching. The theory - practice - theory cycle then has been: basic courses - teaching experience - elementary methods - teaching experience. In this cycle, the first teaching experience is defined as a readiness factor for both the elementary methods course and the final student teaching.

In an endeavor to create an opportunity for a pre-methods laboratory experience of the highest caliber, the official document of the Association for Student Teaching, which was designed for the evaluation of laboratory experiences, was consulted.[2] Some of the criteria which the proposed experimental laboratory situation sought to fulfill were:

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[1] *Ibid.*, p. 369.

[2] Ronald Qinn Swaim, "Criteria for Evaluating Programs in Professional Laboratory Experiences in Teacher Education." Document adopted by the Executive Committee of the Association for Student Teaching, 1961 (Mimeographed).

1) Philosophy and practices in the cooperating schools should closely approximate those advocated by the teacher-education institution.

2) The program should provide experiences in school and community situations in which the student teacher is likely to find employment.

3) The program should provide an environment which fosters creativity and research.

4) The program should provide for individual differences and needs of student teachers.

5) The program should be so organized as to be beneficial to the pupils.

6) The program should provide for a wide range of experiences of an increasingly responsible nature, ordinarily expected of a regular certified teacher, with provision for the students' active rather than passive participation in such experiences.

7) The program should provide for integration of professional laboratory experiences with professional college courses.

8) The program should provide opportunities for student teachers to meet and work harmoniously with parents.

9) The program should provide opportunities for observation and participation with pupils under the guidance of a competent professional person prior to student teaching.[1]

Summary

Student teachers, because of the multiplicities of demands made by their college and student teaching environments, and because of the complexities of their new responsibilities, often do not apply effectively those principles which have been developed in their methods courses. An actual session of classroom experience, on a less formal basis and with smaller groups of children, supervised in such a manner that the children would benefit as well as the education students, seemed to be a way of giving the teacher candidates a feel for the classroom, an experimental knowledge of children, and a felt need of lesson planning, motivational procedures, and other applicable techniques.

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[1] *Ibid*., pp. 2 - 6.

CHAPTER II

STRUCTURE OF THE EXPERIMENT

Because Marygrove is a small woman's college with a relatively stable student body, less diversification in areas of teacher training, and a fairly homogeneous group of students with respect to family background, there was greater possibility that experimentation in the theory-practice-theory cycle could be more readily controlled than in larger, more diversified institutions. A plan was devised through which twenty students who were completing their Junior year at Marygrove College would be enabled to obtain the regular required credit in Directed Laboratory Experiences With Children at a nearby private school, by teaching small groups of children reading and arithmetic for two hours each morning of a regular six weeks summer session. These students were to be supervised by the director of the experiment and a particularly well qualified assistant who had had considerable experience both as a supervising teacher and as an elementary school principal. The notice about this arrangement was issued at the same time as were notices about the other summer school courses that were to be given at the college. Twenty-five students registered, but were kept in order according to date of registration. By the time final arrangements were completed, the number had dwindled to twenty-one. The twenty-first student was employed as a rotating librarian and received credit for work with children but did not figure in any part of the experiment. These twenty students were not given any verbal instructions beyond those that all of the elementary school teacher candidates had received during their preceding psychology and foundation courses. However, they did view a series of indirect classroom observations through the medium of Audio-Slides. These same Audio-Slide sequences were later shown to the remainder of the elementary school students during the subsequent course in elementary school methods, and at these showings those who had previously viewed them were excluded.

Design and Methodology

The general design of this study was a Posttest-Only Control Group type, except for the attempt to measure personality changes in sociability and emotional stability. This single phase followed the Pretest-Postest Design and evaluation was attempted through application of a t test of significance. Although the Posttest-Only Control Group Design has not often been used for research in the behavioral sciences in the past, it is rapidly becoming a more useful and controlled design through the application of the statistical controls of analyses of variance. It may thus be thought of as the third and fourth groups of the Solomon Four-Group Design with controls for testing as its main effect, but, including also, controls for specific interactions.[1] The universe from which the experimental subjects were to be drawn however, consisted of a population just under eighty. Thus, since the actual drawing of the sample was on the basis of voluntary individual decisions by students, who themselves belonged to a group which fulfilled certain definite criteria, the sampling method used was that of Purposive Assignment. This method of sampling may be defined as: "Selection of a research sample by predetermined criteria in order to achieve a desired end product."[1] It is a form of selection which can legitimately be used because it is known that it will produce well-matched groups. Other advantages of the purposive assignment according to McAshan, include:

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[1] Donald T. Campbell and Julian C. Stanley, "Experimental and Quasi-Experimental Designs for Research on Teaching," Handbook of Research on Teaching, ed. N. L. Gage (Chicago: Rand, McNally and Co., 1964), pp. 195 - 201.

1. Use of the best available knowledge concerning the sample subjects.
2. Better control of significant variables.
3. Ease of checking data used in matching sample groups.
4. Homogeneity of subjects used in sample.[2]

The sample thus achieved for the purposes of this study consisted of twenty elementary school teacher candidates who were just completing their third year of college. These students constituted the experimental group and participated in the directed session of summer school teaching. The control group was drawn from the remaining students and matched to the experimental group on the basis of a combination of general ability as measured by the _California Test of Mental Maturity_, and specific achievement as measured by the George Washington University _Teaching Aptitude Test_. For matched sample groups, see the following table.

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[1] Hildreth Hoke McAshan, _Elements of Educational Research_ (New York: McGraw-Hill Book Co., 1963), p. 84.

[2] _Ibid._, p. 65

TABLE I

MATCHED SAMPLE GROUPS

Experimental Group			Control Group		
Student Code No.	Ability: Raw Score Range[a]	Aptitude: Raw Scores	Student Code	Ability: Raw Score Range	Aptitude: Raw Scores
3	165-170	95	41	165-170	95
7	172-178	93	26	172-178	93
8	180-183	88	72	180-183	88
9	158-163	97	33	158-163	97
39	144-150	88	84	144-150	88
44	165-170	93	88	165-170	93
45	185-190	101	4	185-190	101
47	172-178	89	14	172-178	89
50	185-190	96	13	185-190	96
51	156-163	99	6	156-163	99
52	180-183	89	54	180-183	89
57	165-170	92	5	165-170	92
58	180-183	89	12	180-183	88
59	144-150	100	65	144-150	100
63	192-200	98	61	192-200	98
66	152-156	84	79	152-156	86
67	185-190	96	46	185-190	96
71	152-156	92	49	152-156	90
75	138-142	85	42	138-142	85
77	185-190	92	10	185-190	93
MEAN		92.8			92.8

[a] Classified raw score ranges as derived from TABLE 14, "Percentile Norms," Manual: California Test of Mental Maturity: Advanced, 1957 Edition (Los Angeles: California Test Bureau, 1957), p. 38.

The constants or criteria already operative were: identity of previous education courses taken, both as to content and as to instructors; sex, since they were all girls; age, as they were all undergraduate students of normal undergraduate age; and general socio-economic background, as all subjects used were drawn from one of the middle sociological groupings. Personality variables of sociability and emotional stability were also to be held constant through an analysis of covariance when anxiety levels and achievement levels in student teaching were to be assayed. Measures of these two qualities were to be obtained through the administration of the Gordon Personal Profile.

Rationale for the Use of the Specific
Direct and Indirect Controls

There are no consistent and mutually supportive studies which indicate that any one of the variables, general ability, scholastic achievement, or emotional stability and sociability, are valid predictors of success in teaching when used in isolation. Although Ryans and others do report positive relationships between general high ability and success in teaching, they so so in context with other personal qualities. Indeed, most evidence in the educational order, points to the fact that such a general index loses its value when it is related to the highly specialized tasks of the educational process.[1]

While indices of general ability are usually acceptable for forming matched groups, achievement score levels seem even more acceptable. After reviewing a number of studies pursuant to such a judgment, Bloom concludes:

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[1] Benjamin S. Bloom, "Testing Cognitive Ability and Achievement," Handbook of Research in Teaching, N. L. Gage, ed. (Chicago: Rand McNally and Co., 1964), p. 383.

> The implication for the research worker is that measures of relevant previous achievement are more likely to be useful controls than are measures of general intelligence . . .[1]

Again Ryans reports that highly selected women teachers at the elementary school level, "Enjoyed school when they were students themselves," and, "Showed superior accomplishment when in school."[2] He reports these, also, along with other characteristics of a social and intellectual nature. Chief among the qualities which he cites are those of sociability and emotional stability.

These two qualities were thus chosen as possible covariates because of the accumulating experimental evidence that the two characteristics have some predictive value with respect to success in student teaching or in career teaching. These findings seem to be particularly true for women. The most summary and, perhaps, most positive statement with respect to these personality variables, is that of A. S. Barr who pioneered in this area of prediction as far back as 1920 when he was in charge of supervision in the Detroit Public Schools. With seven other associates he has analyzed over seventy-five doctoral studies dealing with the problem of teacher effectiveness. Of these seventy-five, Dr. Barr, himself, conducted an analytic study of seven concerned with those personal qualities which might predict teacher effectiveness. These seven he characterizes as illustrating, " . . . departure from the commonplace in some important respect."[1] The studies used were: R. E. Gotham's study, Personality and Teacher Efficiency, 1945; Herbert I. Von Haden's work, An Evaluation of Certain Types of Personal Data Employed in the Prediction of Teaching Efficiency, 1946; Harley E. Erickson's A Factorial Study of Teaching Ability, 1954; Arthur Singer, Social Compentency and Success in Teaching, 1954; Anthony Schwartz, A Study of Discriminatory Efficiency of Certain Tests of the Primary Source Personality Traits of Teachers, 1950; Harold Montross, Temperament and Teaching Success, 1954; Margaret Lois Jones, Analysis of Certain Aspects of Teaching Ability, 1956; and Carroll Edward Flannigan, The Predictive Value of the Minnesota Multiphasic Inventory, 1961. Although these studies employed a great variety of instruments and, at first glance, seem even to have reached divergent conclusions, Barr observes, after correlating measures of personality obtained by the various instruments, with measures of teaching success:

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[1] Ibid., p. 386.

[2] David G. Ryans, Characteristics of Teachers: Their Description, Comparison, and Appraisal (Washington, D.C.: American Council on Education, 1960), p. 365

> The most promising positive relationships were found for objective measures of emotional stability, social competence, certain scores on the Minnesota Multiphasic Personality Inventory and tests of temperament.[2]

In a most comprehensive study which seems well on its way to becoming the classic research study in teacher appraisal, David G. Ryans, with respect to personal qualities of highly selected elementary women teachers, concludes that they are:

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[1] A. S. Barr, "The Personal Prerequisites to Teacher Effectiveness," Wisconsin Studies of the Measurement and Prediction of Teacher Effectiveness (Madison, Wisconsin: Dembar Publications, Inc., 1961), p. 99.

[2] Ibid., p. 106.

> More emotionally stable than average adult
> More friendly than average adult
> More cooperative and agreeable than average adult

And further, on the same page:

> Superior intellectual abilities, above average school achievement, good emotional adjustment, attitudes favorable to pupils, enjoyment of pupil relationships . . . and descriptions similar to those noted in this chapter appear to apply very generally to teachers judged by various kinds of criteria to be outstanding.[1]

His conclusions are all the more valid in that the study from which they are drawn was a longitudinal as well as a cross-sectional study involving three large substudies, 6,179 teachers, 1,747 schools, and covering a data-gathering period of sixteen years. In all, ninety-eight different research projects were completed by the staff of this *Teacher Characteristics Study* requiring the administration of almost every known scale for teacher assessment, the use of trained observers, the production of a comprehensive *Classroom Observation Record*, and resulting in over 100 tables of statistical analyses of important and interrelated data.

Having been an observer for the same *Teacher Characteristics Study* for three years, John C. Gowan chose a group of twenty highly selected teachers out of 3,000 elementary women teachers in Southern California for a small group study which he felt would yield certain results not observable in the larger cross sectional study. To these women, whose mean age was lower than the mean age of the women in the Characteristics Study, he administered the *Guilford-Zimmerman*

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[1] David G. Ryans, *Characteristics of Teachers: Their Description, Comparison, and Appraisal* (Washington, D. C.: American Council on Education, 1960), p. 366.

Temperament Schedule, The California Psychological Inventory, the Allport-Vernon Study of Values, and the Kuder-Preference Record (form BM). In addition, he interviewed each subject for one and one-half hours. In characterizing his criterion group as outstanding women elementary teachers, he says, "They are less ascendant in face-to-face situations but have excellent personal relations and are emotionally very stable."[1]

Starting from a totally different basis, and examining a very little-examined portion of the teaching population, Sister Mynette Gross made a study of factors which condition success in teaching in Catholic elementary schools. Having administered a two-question schedule to 614 teachers, most of whom were members of religious communities for women, and having compared those responses with the ratings of community supervisors, Sister Mynette discovered that there were real differences in six characteristics between the "High Group" and the "Low Group": gracious demeanor, cooperation, spiritual influence, professional spirit, good judgment, and emotional stability. Of these qualities, however, Sister Mynette says, "It appears that of the six personal characteristics, emotional stability and good judgment had the most bearing on success or failure in the classroom . . ."[2]

In a most unusual study, the first of this nature ever attempted with female teachers, Lucio and Wenger endeavored to appraise and predict teacher performance through psychophysiological means.[1] They based their study on the theses that measures of the autonomic nervous system would afford a means of predicting those students who would be less likely to withstand the stresses of teaching, and, these same physiological measures, used in connection with certain indices of personality and controlled observation of student teachers would improve predictive measures of teacher effectiveness. Using a sample of 217 student teaching female students enrolled in elementary education, they administered a series of psychological tests and an extensive series of physiological tests assaying the functioning of the autonomic nervous system. The justification for the latter procedures was based on the demonstrable relationship between individual differences in ANS function and emotional behavior. After sixteen weeks of student teaching, trained observers rated the subjects on both the Classroom Observation Record developed by Ryans and the University of California Rating Scale. Through correlational procedures it was discovered that three of the psychological and physiological variables proved to be significantly related to indices of student teaching success. Expressed as variables and their relationships, these were: (a) the scores of sociability on the Guilford Zimmerman Scale were positively related to teaching performance, (b) high level of muscular tension was negatively related to teaching success (the mean muscle tension was assumed to be indicative of stress proneness, a lack of emotional stability), and

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[1] John C. Gowan, "A Summary of the Intensive Study of Twenty Highly Selected Elementary Women Teachers," Journal of Experimental Education, XXVI (December, 1957), p. 123.

[2] Sister Mynette Gross, Teaching Success of Catholic Elementary School Teachers (Washington, D. C.: Catholic University, 1953), p. 66.

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[1] William H. Lucio and M. A. Wenger, Prediction of Teacher Performance and Emotional Stability: A Psychophysiological Pilot Study of Female Student Teachers (Los Angeles: University of California, 1961).

(c) elevated finger temperature was positively related to teaching performance. Interpreting their findings, the authors concur in concluding that, " . . . the three variables mentioned in the foregoing paragraphs may be used with some success in the prediction of student teaching performance. . . They do permit one to characterize groups of good student teachers as relaxed, social, and possessing high finger temperature."[1]

A unique study by W. Maxine Gray, demonstrates the need for considering all three types of factors, ability, achievement, and personality characteristics, in predicting success in student teaching. Although she was investigating the potential of the Minnesota Teacher Attitude Inventory for the selection and guidance of student teachers, she also demonstrated the necessity of considering the three variables together in their relationship to an earned grade in student teaching: " . . . no single measure used in this study was sufficiently significant, when used alone, to advocate its use in the prediction of student teaching."[2] Through a process of multiple correlation involving the four variables: (1) grade in student teaching, (2) scores on the Minnesota Teacher Attitude Inventory, (3) scores on the American Psychological Examination for Freshmen, and (4) honor point average at the time of admittance to college, Dr. Gray concludes that a procedure for selection of teacher candidates should be based on a combination of the last three measures named.[1]

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[1] Ibid., p. 62.

[2] W. Maxine Gray, "Use of the Minnesota Teacher Attitude Inventory in the Selection, Counseling, and Placement of Student Teachers." (Unpublished Doctoral Dissertation, College of Education, Wayne State University, 1956), p. 128.

Although the conclusions of all the characteristic studies quoted above are of an inferential nature based on empirical data and may thus be most useful when they are considered in an actuarial sense, nevertheless, they stress the importance of the relevant personality variables which were used in this study as testing controls when applying the statistics of covariance.

Restatement of Problem in Terms of Operational Hypotheses

Combining, then, the results of the laboratory-experience studies quoted in the review of literature and those teacher-characteristics studies above which have related some personal quality to success in teaching, four hypotheses seem relevant to the experimental schema:

1. The directed classroom experience as conducted in this study will produce measurable personality changes in the students participating in the experience (sociability and emotional stability).
2. Those students who will have had this experience will manifest fewer and less intense anxieties about their student teaching.
3. The students who have participated in the pre-methods directed classroom experience will manifest higher levels of achievement in the subsequent elementary methods course.
4. These same students will demonstrate higher levels of teaching competence in their student teaching experiences.

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[1] *Ibid*., p. 134.

Summary

The experimental subjects for this study were drawn from a group of students fulfilling definite criteria, and were group matched to a control group on the basis of a combination of general ability and specific aptitude. For purposes of assessing any comparative measures between the two groups, an analysis of covariance was to be applied using a combination of scores for sociability and emotional stability as covariates. Justification for the use of these personality traits as indirect controls was based upon the results of a number of important and rigorously conducted research studies in the area of prediction of success in teaching. The method for measuring personality changes in those same traits as a result of a directed classroom experience initiated prior to elementary methods, was to be of a pretest-posttest nature with a simple _t_ test of significance.

CHAPTER III

SELECTION AND CONSTRUCTION OF DATA GATHERING INSTRUMENTS

The validity of this experiment, which was in no way designed to be a study in the prediction of success in student teaching, does depend, however, on the degree of control attained over those factors which have been found to possess some predictive power. Hence evaluative instruments used for achieving direct and statistical control for the matched sample groups, were chosen for their specific power to measure those characteristics which have been judged to be of value in predicting success in teaching: general ability, school achievement, and the personality variables of sociability and emotional stability. The control subjects were thus group matched to the experimental subjects according to a combination of general ability as measured by the California Test of Mental Maturity, and of specific achievement in previous education courses as measured by the Teaching Aptitude Test of the George Washington University Series. The strategic personality variables, however, as measured by the Gordon Personal Profile, were to be controlled indirectly through analysis of covariance.

Selection of the Standardized Instruments

Since one of the bases for matching the sample groups was that of general ability, a test was needed that furnished fairly valid normative data. The California Test of Mental Maturity, 1957 Advanced Edition, seemed admirably designed for such a purpose. It has the advantages of ease of administration and scoring, adequate standardization population, has been validated against both the Stanford-Binet and the Wechsler tests, and has been the object of sufficient research to make it a popular tool of evaluation even at the graduate level. As one of its principal critics says in his review of the 1957 edition, "To summarize, the test is an excellent and usable test of general intelligence . . . "[1] Its greatest advantage for this particular experiment is the classification of raw scores into ranges corresponding to percentile norms for various levels of school population. For matching the sample groups, Table 14, "Percentile Norms - California Test of Mental Maturity - Advanced - 1957 Edition - College Sophomores and Graduates," was used.[2] The classified raw scores for college sophomores (language and non-language factors) were totaled, producing small-step raw score ranges for ease of selecting individuals from the total population to match those in the experimental group.[3]

When the question of matching the groups on the basis of achievement was approached, however, several problems were apparent.

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[1] John E. Milholland, "California Test of Mental Maturity, 1957 edition," A Review. Fifth Mental Measurement Yearbook, ed., Oscar K. Buros (Highland Park, New Jersey: The Gryphon Press, 1959), p. 439.

[2] Elizabeth T. Sullivan, Willis W. Clark, and Ernest W. Tiegs, Manual - California Test of Mental Maturity - Advanced 1957 Edition (Los Angeles: California Test Bureau, 1957), p. 38.

[3] For matched sample groups, see Table 1, p. 18.

Since all the students accepted at Marygrove College must have had a B average at the secondary level, and since, there was a three year gap between the high school point-cumulation and the matching process, the secondary school records were considered unsuitable for the present experimental purpose. Furthermore, as all the students must pursue an academic major, and the total population from which the samples were to be drawn, had majors of varying degrees of disciplinary difficulty, college achievement levels also seemed to be potential bias factors. Thus, a test was sought which would yield a raw score index of achievement in courses which had been required of all students who would figure in any way in this experiment.

The Teaching Aptitude Test of the George Washington University Series which was finally chosen, was selected because, for the education students at Marygrove College, it constituted an achievement, rather than an aptitude test.[1] Since the test was first published in 1927, some words, such as "Normal School" had to be interpreted for the students. Also, the shortened edition was chosen, since in the more abbreviated form certain other points of dated theory have been eliminated. Nevertheless, the entire 110 test items in parts one and two, were found to be items connected with principles developed in the preceding education courses which had been required courses for all of the students.

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[1] F. A. Moss, T. Hunt, and F. C. Wallace, Teaching Aptitude Test, Shortened Edition: George Washington University Series (Washington, D. C.: Center for Psychological Service, 1927). See Appendix II, Exhibit A for the test itself.

A careful analysis revealed the course placement of items as seen in the following table.

TABLE 2
COURSE DISTRIBUTION OF ITEMS ON THE TEACHING APTITUDE TEST

Name and Description of Course	Number of Relevant Items
General Psychology: (introduction to psychology as a science)	6
The Learner and the Learning Process in the Elementary School: (child growth and development; the learning process; overview of testing, mental hygiene, guidance and counseling)	54
Structure, Functions and Purposes of Educational Institutions: (Structure of American education; goals and philosophy of education; the role of the teacher; and characteristics of the profession)	50
Total	110

Part three of the Teaching Aptitude Test is a comprehension test, the content of which is specific to the area of technical speech and speech correction. As several of the teacher candidates involved were speech majors, this section was omitted because of its potential for distorting the scores as indices of achievement.

For obtaining measures on the variables sociability and emotional stability, a simple scale was needed. It had to be a scale which could assess, not only the particular personal qualities as named, but should also provide data with respect to their relative independence as character traits, the psychological meanings of the traits as named, and some empirical proof of their stability and consistency. The Gordon Personal Profile has been standardized and revised on the basis of data gathered on more than 5,000 college students, as well as on other subjects from widely varying regions and populations. The total Gordon Personal Profile yields measures of four established traits: responsibility, ascendancy, sociability, and emotional stability. For the construction of this test, these particular traits were derived from two separate factor analyses. The same traits have been further identified by other investigators such as Guilford, Cattell, and Mosier.[1]

As a forced-choice-technique scale, the Gordon Personal Profile seems to be less susceptible to distortion than do conventional questionnaires and inventories.[2] Several studies other than those conducted by the author, Dr. Gordon, have tested the distortion-susceptibility of the profile. Rusmore, in particular, endeavored to test a statement made in the manual for the 1953 edition. Rusmore concluded, "Present results support the contention that the Gordon Personal Profile' . . . probably is less subject to faking than inventory-type instruments.'"[3]

Rusmore's study also seems to point toward a relatively high degree of stability of trait scores over a short span of time. Using eighty-one college students, Rusmore pretested and retested them a week apart. The second testing was done under conditions which would seem to place the students under great pressure to make a good impression, since this testing was done under simulated employment conditions. Yet the author reports that there were no statistically significant differences for scores on sociability and emotional stability, although there was a significant difference on the responsibility scale.[1]

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[1] Leonard V. Gordon, Gordon Personal Profile Manual (New York: Harcourt, Brace, and World, Inc., 1963), p. 12.

[2] See Gordon Personal Profile, Appendix II, Exhibit B.

[3] Jay T. Rusmore, "Fakability of the Gordon Personal Profile," Journal of Applied Psychology, XL (June, 1956), p. 177.

Gordon and Stapleton later used 121 high school students, retesting them likewise, but for an actual job situation. Although their retesting took place three months after the original testing, the authors reported a correlation coefficient of .88 for emotional stability and one of .90 for sociability.[2]

The psychological meanings of the traits as described by the author of the profile, and as reflected by the eighteen sets of descriptive phrases in the test itself, follow:

Emotional Stability

> High scores on this scale are generally made by individuals who are well-balanced, emotionally stable, and relatively free from anxieties and nervous tension. Low scores are associated with excessive anxiety, hypersensitivity, nervousness, and low frustration tolerance. Generally, a very low score reflects poor emotional balance.

Sociability

> High scores are made by individuals who like to be with and work with people, and who are gregarious and sociable. Low scores reflect a lack of gregariousness,

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[1] Ibid., p. 176

[2] Leonard V. Gordon and Ernest S. Stapleton, "Fakability of a Forced-Choice Personality Test under Realistic High-School Employment Conditions," Journal of Applied Psychology, XL (August, 1956), p. 261.

> a general restriction in social contacts, and, in the extreme, an actual avoidance of social relationships.[1]

It is to be noted that the Ryans description of outstanding teachers as having:

> . . . liking for children and interest in their development . . . frequently members and officers of clubs . . . more friendly . . . more tolerant . . . more interested in social service than the average adult . . .[2]

makes specific the qualities defined in the Sociability Scale.

Structured Interviews with the Experimental Subjects

Although the experimental subjects were not aware of the total experimental nature of their summer work with children, nevertheless, they knew that such small-group work with children had never before been conducted on the college campus under precisely the same conditions. Previous to the present experiment, such remedial work with normal children had always been done by seniors who had completed their methods course and who were ready for student teaching. Furthermore, as these same experimental subjects felt rather unprepared for the venture, they were eager for on-the-spot help, frequently sought out their supervisor with specific problems, and very readily answered any questions proposed. Outside of these many self-sought interviews, two other rather structured ones were held with each experimental participant. At the end of the first week of the summer teaching session, each girl was asked the following questions:

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[1] Gordon, op. cit., p. 3.

[2] Ryans, op. cit., pp. 365 - 366.

1. What discovery did you make during this very first week about dealing successfully with children in a classroom situation?
2. What technique, device, or teaching procedure have you found most helpful in getting the children interested and involved in the work of your classroom?

During the final week of the summer session, another brief interview was held with each girl at which the following questions were asked:

1. What are some of the benefits which you think you have derived from this summer's experience?
2. In what way do you think you have changed with respect to your previous ideas as to "What is teaching?"
3. What insights do you feel you have gained with respect to your knowledge of children and their abilities?
4. What do you think constitutes true motivation in the classroom?
5. What do you think is the characteristic most needed by a good teacher?

Every effort was made in these interviews to avoid any priming. A question was simply asked and the answer jotted down openly, although other questions were asked and other topics discussed as they arose naturally.

Construction of the Pre-Teaching Anxiety Schedule

The Pre-Teaching Anxiety Schedule administered in this experiment, developed out of a pilot study conducted early during the year preceding the present investigation. An open-ended questionnaire was administered to 135 student teachers the day before they were to report for their first student teaching contact. These students were asked to write down anonymously the three or four features of student teaching which were causing them the most anxiety in prospect.

(Unlike the present experiment, all of these students had taken their methods courses and only eight of their number had engaged in a summer of small-group teaching as described in this investigation.) Their statements of anxiety were analyzed, categorized, and easily classified under seventeen headings. These categories formed the basis for a simple self-rating scale which was administered to the same group the following day. On this first anxiety schedule the items were listed in descending order of anxiety as gathered from the open-ended questionnaire. After the actual scale was administered, however, even to that original group from which it had been drawn, the order of expressed anxiety was slightly different as may be seen from Table 3 on the following page. It was obvious that some anxiety situations, such as teaching for the college supervisor, had not even occurred to some of the students until they saw it in print and then it assumed a formidable aspect. Likewise, racial discrimination, which had been registered by only one student on the open-ended questionnaire, dropped out entirely on the scale itself, although the same several negro students were present for both administrations.

On that original derived rating scale, the students were limited to one of three expressions of anxiety, "Very anxious, Somewhat anxious," and, "No anxiety." On the revised scale, however, the number of degrees of expression of anxiety was raised to four in order to force the respondents to make a decision toward one end of the scale or the other.[1] The revised expressions are:

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[1] For revised Pre-Teaching Anxiety Schedule, see Appendix II, Exhibit D.

TABLE 3

ORDER OF FELT ANXIETY AS EXPRESSED BY ORIGINAL RESPONDENTS

Open-Ended Questionnaire	Derived Self-Rating Scale
1. Having good classroom order	1. Having good classroom order
2. Getting along with my sponsoring teacher	2. Getting along with my sponsoring teacher
3. Having sufficient knowledge of the subject matter	3. Teaching for my college supervisor
4. Knowing the right teaching technique for each subject	4. Being liked and accepted by the children
5. Being liked and accepted by the children	5. Being able to make the children understand me
6. Being able to make the children understand me	6. Holding their interest and attention
7. Holding their interest and attention	7. Having sufficient knowledge of the subject matter
8. Looking too young to be a teacher	8. Knowing the right teaching technique for each subject
9. Fear of standing before a group	9. Fear of standing before a group
10. Not being able to keep within time limits	10. Not being able to keep within time limits
11. Not being able to answer children's questions	11. Not being able to answer children's questions
12. Not being able to meet the needs of all the children	12. Looking too young to be a teacher
13. Fixing bulletin boards	13. Not being able to meet the needs of all the children
14. Keeping records	14. Fixing bulletin boards
15. Meeting the principal and other faculty members	15. Keeping records
16. Teaching for my college supervisor	16. Meeting the principal and other faculty members
17. Racial discrimination	

"Very worried, Somewhat worried, A little anxious, No anxiety." The new descriptive phrases seem to be clearer, since in the original scale the phrases, "Very anxious" and "Somewhat anxious," might have been interpreted as, "I am anxious to have good order . . . to have the children like me . . ."

In general, the Pre-Teaching Anxiety Schedule was patterned along the lines of a graphic, self-rating scale. Through previous administration and revision, there was an attempt to produce a scale which would yield verifiable, reproducible data within the limits of the accuracy of the powers of self-observation of the raters themselves. The process of drawing the anxiety elements of the scale from apprehensive pre-teaching student teachers was designed to insure that the categories of the rating scale be relevant to the defined areas of investigation, namely, pre-student-teaching anxieties.

Construction of Unit Tests in the Methods Course

The conduct of both the teaching and the testing situations of the concentrated methods course posed several problems. The foremost was the necessity and difficulty of maintaining objectivity, not only in the evaluation of student achievement, but even in the presentation of subject matter. Since the director of the total experiment had likewise supervised the summer session and would teach the methods course, great care had to be taken that the total methods course was conducted in an objective and unbiased manner. Although rapport would undoubtedly carry over from the summer, as well as the knowledge of the experimental subjects' expressed needs in the area of teaching, these factors needed to be controlled in both the teaching and the testing processes.

The first problem, that of unbiased presentation of subject matter was met by making use of an objectively constructed outline of the material to be covered in the course.[1] The outline, which was placed in the hands of each student, was based on the one used the preceding year, with a few minor adaptations in the form of additional data in line with current research. A classroom assistant was also procured, because of the large number of students involved, as well as for aiding in the control of presentation of subject matter. This assistant shared in lectures and demonstrations and assisted the director in the planning of classroom procedures and evaluation of presentations. Likewise, a full time curriculum materials person took total responsibility for the introduction of elementary school text books, graphic materials, and other audio-visual resources to all of the students in small-group laboratory sessions. The students received help from these two unbiased assistants in lesson planning, the working out of motivational situations, and any other problems which they wished to take to them.

The problem of testing was met by the production of objective type tests based on the subject matter indicated in the course outline. For guidance in the construction of the test items, conscientious use was made of the Taxonomy of Educational Objectives.[2]

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[1] For Course Outlines, see Appendix II, Exhibits E and F.

[2] Benjamin S. Bloom (ed.), Taxonomy of Educational Objectives, Handbook I: Cognitive Domain (New York: David McKay Company, Inc., 1956).

An effort was made, within the framework of the objective type test items, to evaluate, not only knowledge of specific facts and terminology, but also, knowledge of principles, theories, and structures.

SAMPLE TEST ITEMS[1]

Make every sentence which you judge false into a true statement of principle by changing any part except an underlined part. You may justify your choice of added words or substituted words in the right hand column. If you judge a sentence true, merely mark it TRUE.

Since our language is not a true regularized language, it is more or less a waste of time to have children generalize as to spelling rules.

The adequacy of a child's experiential background depends on the quality and quantity of his vicarious experiences.

Phonetic analysis should be so well taught that it can be used independently of other word clues.

Superior readers need a considerable amount of your time so that they will not become bored or acquire habits of mental laziness.

Translation and extrapolation as facets of comprehension were also assessed, as well as the intellectual skills of application, analysis, and synthesis.

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[1] For complete set of Unit Tests, see Appendix II, Exhibits G, H, I, J, and K.

SAMPLE TEST ITEMS

Show by a semi-concrete illustration and accompanying explanation why multiplying by a fraction yields a number less than that you started with.

Make up a verbal problem in subtraction for a third grade, incorporating the remainder concept and being most readily relevant to the decomposition form of subtraction algorism.

For each set below find the correct tabulation and write its letter on the answer line. You may use a tabulation more than once. Some tabulations may not be used at all.

The set of even numbers between 5 and 17 ____

$(x \mid x+3 < 9)$ U = N. ____

The set of odd numbers less than 10,000 ____

The set of natural numbers ____

$(x \mid x+5 < 2)$ U = N. ____

$(x \mid x+3 < x)$ U = N. ____

The set of natural numbers less than 6 ____

a (1, 2, 3, . . ., 9999)

b ( )

c (6, 8, 10, 12, 14, 16)

d (1, 3, 5, . . ., 9999)

e (1, 2, 3, . . .)

f (5, 6, 7, . . ., 17)

g (1, 2, 3, 4, 5)

h (1, 2, 3, . . ., 10)

By concentrating, therefore, on items which tested behavioral changes, those essay-type questions, which can so easily be biased both in construction and in evaluation, were avoided and a rigorous objectivity in testing all students was maintained.

Construction of the Student Teacher Rating Scale

Although the cooperating college has its own student teacher rating scale, the Semester Report of Directed Teaching, it was felt that a scale, focusing on more specific correlates of classroom behavior, was needed. The *Classroom Observation Record* of the teacher characteristics study mentioned above has demonstrated its worth as a research tool and would seem to have been the most logical instrument. Its total construction, however, with the need of making use of a special assessment blank, a 216 item glossary, and a seven point scale, indicated the need for special training for its use. Since the scale would have to be used by the supervising teachers, and since training on such a broad scale, was far beyond the scope of the present investigation, the *Classroom Observation Record* could not be used. The "Generalized Descriptions of Critical Behaviors of Teachers" of the same study, however, showed interesting promise. These critical behaviors, twenty-five in number, had been developed from 500 critical incidents submitted by the participants in the study. These descriptions may each be characterized as being:

1. Within the *personal-social* domain.
2. In evident *relation to teaching*.
3. Describable in terms of *bi-polar extremes*.
4. Describable in *unambiguous terms*.
5. *Observable* teacher acts.
6. Describable in terms of *specific acts or performances*.
7. Relatively *independent* of other behaviors in the list.
8. Equally applicable to teachers in *different kinds of school situations*.
9. *Independent of a particular philosophy* or theory of education.[1]

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[1] Condensed from: Ryans, *op. cit.*, pp. 78 - 79.

With the permission of the American Council on Education, these bi-polar characteristics were used to construct a graphic four-point scale, with the upper and lower end of each scaled characteristic defined by a descriptive phrase:

SAMPLE ITEMS[1]

Alert, appears interested			Is apathetic, dull, appears bored
4	3	2	1

Likes fun, has a sense of humor			Is overly serious, too occupied for humor
4	3	2	1

This critical-incident technique scale seemed to provide an unambiguous, objective, and operational referent for the sponsoring teachers to use in assessing their student teachers.

The students were to be rated by both of their sponsoring teachers near the end of each of their two student teaching contacts. A covering letter accompanied each scale explaining that this special rating would not be used for computing either the midsemester or the final mark of any student teacher.[2]

Summary

For purposes of achieving direct control in matching the experimental and control groups, a combination of raw scores obtained from a test of general ability and a test of specific achievement were proposed. The California Test of Mental Maturity and the Teaching Aptitude Test were chosen as having the evaluative features necessary to achieve well matched groups. To hold the relevant personality variables constant in the control process, a test was needed which would yield stable measures of the required traits. The Gordon Personal Profile was used because of its apparent consistency in measuring the relatively independent and well-defined personal characteristics, sociability and emotional stability.

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[1] For complete Student Teacher Rating Scale, see Appendix II Exhibit L.

[2] For covering letter, see Appendix I, Exhibit M.

Questions for the structured interviews with the summer school teachers, the Pre-Teaching Anxiety Schedule, the objective-type tests for the methods course, and the Student Teacher Rating Scale were original instruments and were constructed to meet the specific needs of the present experiment.

CHAPTER IV

COLLECTION AND ANALYSIS OF DATA DIRECTLY RELATED TO THE SUMMER EXPERIENCE

The major purpose of this study has been to determine whether measurable transfer exists between an informal type of directed classroom experience, initiated prior to an elementary methods course, and, achievement in that methods course and in student teaching. Aside from the empirical data gained from the use of definite instruments, it seemed important to obtain, also, some subjective evidence from the participants themselves, relevant to the benefits of such an experience.

First Structured Interview

In order to obtain such data from the participating students, two structured interviews were held with each of them. The first one was held early in the second week of the summer teaching session, and the second, at the end of the experience. At the first interview only two questions were asked:

1. What discovery did you make during this very first week about dealing successfully with children in a classroom situation?
2. What technique, device, or teaching procedure have you found most helpful in getting children interested and involved in the work of your classroom?

An analysis of their responses to the first question showed that the students had "discovered" in some practical form, seven principles of classroom management and procedure:

1. Interest needs to be aroused and when it is aroused, it becomes self-generating.
2. Order must be obtained in the classroom for learning to take place, but it should be an order balanced with respect to firmness and kindness.
3. To deal successfully with children, you need to get them to be self-active.
4. The classroom atmosphere should be friendly and homelike.
5. Children need to be noticed and treated as individuals.
6. A good teacher has to both feel and manifest enthusiasm.
7. The teacher needs to be well prepared.

Not all of the principles were "discovered" by all of the students. Some expressed only one, whereas others reported two or three discoveries. The distribution of their responses follows:

TABLE 4

GENERAL PRINCIPLES DISCOVERED BY THE EXPERIMENTAL GROUP

Principle Expressed	Number of Times Expressed
Need of arousing interest	11
Necessity of balanced discipline	11
Children need to be self-active	8
The teacher must be enthusiastic	6
The children need to be treated as individuals	5
The teacher must be well prepared	4
The classroom atmosphere should be friendly and homelike	4

Few of the students stated their finds in pedagogical mode. Their discoveries were not expressed as principles but as practical resultants of their one week experience. Nevertheless, in most of their statements, there was the foundation for an inductive approach to the generalized principle.

> I found that it takes quite a bit to get the interest of the children, but once you have gotten their interest they become an immense source of ideas and they take delight in adding their original ideas to the class.
>
> The first week taught me, much to my surprise, that children like discipline. You have to have it if you want them to learn, but I found I had to be firm and loving at the same time.
>
> I discovered that if you want the children to be interested and enthused about reading and arithmetic, the teacher must be interested and enthusiastic. The children can tell if you're not interested or prepared.

In response to the second question, getting the children involved in the work of the classroom, the students made five "discoveries" in the realm of technique. Most of their statements were in terms of the specific, but were readily filed under five different general techniques:

1. Get the children physically or mentally involved through the use of some technique requiring a physical or mental response.
2. Make use of many audio-visual materials.
3. Try to relate the things you are teaching to the everyday life of the children.
4. Vary the types of activities and materials.
5. Show approval whenever possible.

Again, not all specific techniques were mentioned by all of the students, but the number of times that some types of techniques were mentioned seems significant. The "discoveries" follow in tabular form:

TABLE 5

TECHNIQUES DISCOVERED BY THE EXPERIMENTAL GROUP

Technique Expressed	Number of Times Expressed
Pupil involvement demanding a physical or mental response: (work at the board, class discussion, encouragement of original contributions, games and contests, quick questioning)	33
Use of audio-visual materials by the teacher: (flashcards, numberline, pictures, tape recorder, filmstrips, clock)	20
Relating topics to children's experiences	8
Varying activities and materials	5
Showing approval	4

As was the case with respect to the answers to the question about dealing successfully with children, the student participants did not advert to any formally stated principle of teaching but expressed themselves in specific terms of their week's experience:

> My third grade math students love the numberline and love to learn via games and they seem to relish competition.
>
> For my reading class I try to get the children talking on a subject related to the story and one on which they can add personal experience.
>
> I have found that the best way to get the children involved and interested is to do something that gets

> them out of their seats. Whether it is doing an arithmetic problem at the board or putting a flashcard in a cardholder, this little bit of exercise seems to wake them up.

Second Structured Interview

Although both of the supervisors were available for an hour before and after each day's teaching period, no regular interviews or structured training sessions were held. Specific help which a girl needed and requested was always given, but only in response to an expressed need. During the last week of the summer teaching experience, however, another, longer interview was had with each student. At this interview, five specific questions were asked simply and briefly and the answers were written down openly.[1] All of the students raised other questions at this time and these were also discussed, so that the interviews proceeded naturally and with no evidence of tension on the part of the experimental subjects. They were instructed that the knowledge thus gained was for the purpose of aiding in the construction of any possible succeeding summer session and would in no way affect their grade in the course for which they were currently registered, Directed Laboratory Work with Children. The questions and a resume of their answers follow.

Question I: What are some of the benefits which you think you have derived from this summer's experience?

Most of the students reported that they had learned more about children: how they were alike; how they were different;

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[1] For complete listing of the five questions, see page 35 of this study.

and how they learned:

> Children are so varied. You need to gear things to each one's ability.
>
> I know more about children, how they react and things I should do to get them to react.
>
> Not having had methods I was thrown more on my own resources and had to seek ways of getting to know the children and how to reach them.

Many of the subjects expressed a felt need to learn more about teaching. Some of these same responses showed a concern for learning about teaching for the sake of the children as well as for themselves as teachers:

> I have a real desire to know more about teaching so that I can do a better job with the children.
>
> Wanting to get my methods class in so that I can find out what mistakes I made. I don't want to make the same mistakes again.
>
> My most important conviction is that I have a lot to learn.

A number of the students reported that they felt they had learned how to deal with children in groups, how to keep order in the group, and how to respond to different classroom situations:

> The experience of having the responsibility of a group of children has taught me the importance of pupil-teacher relationships and gaining control through preparedness and a quiet manner.
>
> Finding ways to handle different situations that seem bound to come up when you have so many different children in your room.

Others mentioned that they had grown in confidence and felt better prepared from that standpoint for their student teaching:

> Confidence! I've always been afraid before a group. Now this fear seems to be gone.
>
> It has given me confidence and convinced me that I like teaching.

Several responses were concerned with lesson planning and with daily preparation:

> I see there's a need for me to do a lot of planning, not just about what I'm going to teach, but even about the jobs in the classroom and the activities.

Some of the isolated responses indicated a real depth-perspective about the benefits derived from the six weeks teaching session:

> The opportunity to talk with parents and discover that often a child's problem is really a family problem.
>
> Learning that teaching could be a real joy, a sharing with others.

Table 6 summarizes the experimental group's feelings about the benefits derived from their summer teaching experience.

TABLE 6

BENEFITS DERIVED FROM THE TEACHING EXPERIENCE

Type of Benefit	Number of Students Reporting
Learned more about children as individuals	19
Feel a need for methods course	11
Know more about handling groups	7
Am more confident	6
Realize the need for planning	5
Miscellaneous	3

Question II: In what way do you think you have changed with respect to your previous ideas as to, "What is teaching?"

In their answers to this question, all but one of the students acknowledged a change in their ideas as to what constitutes the teaching process. The principal change reflected was that teaching is not a telling, talking, static type of activity, but a motivational, interactive, pupil-challenging, dynamic activity:

> I thought a teacher got up and talked. Now I know that she's got to get the children interested so that they want to learn.
>
> I always thought the teacher just told the children and they learned. I found out it was better when I asked the children questions and helped them find the answers.
>
> Teaching isn't just standing up and talking. It's an interaction.

Some of the participants had become aware that teaching is commitment, practically a way of life:

> I never realized the amount of personal involvement that is necessary, the need for your ingenuity, and the vastness of your responsibility.
>
> It's a challenging thing. It doesn't stop with the end of class but requires a conscious awareness of the children's needs.
>
> Teaching involves the whole person practically all of the time. I have found during these six weeks that my whole life revolved around this job. The children became very much a part of my thinking and living.

Several changed their thinking with respect to the relative importance of content and method:

> I thought theory was important. Now I know that children are more important than what you teach.
>
> That it's not essentially method that makes good teaching but a feeling for the needs of the children.

Only one student did not feel that she had changed any of her ideas about the nature of teaching. This student thought that because she had come from a large family and had a definite share in bringing up the younger children, that she, " . . . had seen what makes children tick and could pretty well vision the problems of teaching."

A summary of the changes in student conceptualization of the function of teaching is contained in the following table.

TABLE 7

CONCEPTUAL CHANGES WITH REGARD TO THE NATURE OF TEACHING

Type of Change		Number of students reporting
From:	To:	
A static, telling-function	A dynamic, interactive function	10
A job or chore	A commitment	6
Content or method orientation	A child-centered orientation	3
No change		1

Question III: What insight do you feel you have gained with respect to your knowledge of children and their abilities?

The answers to this question often overlapped with the answers about the benefits which the students felt they had gained from the summer experience. In this second instance, however, the answers were more specific. All of the students reported that they had gained greater insight into the nature of individual differences. Some stressed the differing levels of ability:

> More varied than I thought. Some are faster, some just seem to dream along.

Some students became aware of differing motivational states:

> The fact that a child with native ability can resist learning and not try to achieve.
>
> Some want to learn. Some refuse to learn. Some have only a superficial approach to learning.

Other students commented on the developmental differences from one grade level to another:

> Different age levels differ in response and in respect for the person of the teacher.
>
> Younger children seem to be more willing to learn but less able to concentrate. Older children come with preconceived ideas that they will not like it.

A few noted that children differ in their needs and in their interests:

> Even in this homogeneous group there were different likes and interests. They all had different needs. You have to respect those differences.

One student had become aware that children differ widely with respect to their own self-concepts, whereas two had discovered that children's overt behavior may be disguised behavior:

> Children mask their feelings - mask their behavior. They often have ability they have not been enticed to use.

TABLE 8

INSIGHTS GAINED WITH RESPECT TO INDIVIDUAL DIFFERENCES

Area of Response	Number Responding
General appreciation of individuation	20
Differing levels of ability	11
Differing levels of motivation	8
Developmental differences	7
Differing needs and interests	5
Differing degrees of openness	2
Differing self-concepts	1

Question IV: What do you think constitutes true motivation in the classroom?

In many ways the answers to this question were expanded and generalized versions of the answers to the question asked at the beginning of the experimental session: What technique, device or teaching procedure have you found most helpful in getting the children interested and involved in the work of your classroom? The change in answers between those given near the beginning and those near the end of the teaching period, was in degree of generalization. (See Tables 5 and 9). For example, many of the students, at this later time, recognized that the learning experience generates, in itself, true and intrinsic motivation:

> When children are interested in what they are learning, they do not need any other motivation.
>
> They enjoyed working whenever they felt that they were really learning something.

A number of the responses stressed the necessity of relating content and teaching procedures to the experiential levels of the children:

> Tie up work with their daily experiences.
>
> Relating content to their little lives.
>
> Relating materials to the familiar.

Only two, however, had arrived (at least on the level of expression), at the concept that the discovery approach is a procedure which stimulates curiosity and sets up a challenge:

> Give them a chance to figure out things for themselves; it's a good challenge.

On the other hand, a number had come to the realization that the teacher herself, her enthusiasm, her interest in the children and in the subject matter, may constitute the main motivational factor in the classroom:

> That I'm so interested in them and I let them know it.
>
> Being interested yourself and not being afraid to show your enthusiasm. The older children seem to be motivated by the availability of the teacher's background.

In response to this question, furthermore, there was very little reference to specific audio-visual materials as there was the first week. The several respondents that mentioned such materials as sources of motivation, used the specifics only as examples, and actually expressed the use of such materials in the form of a principle:

> There has to be a good deal of sense appeal: pictures, stories, concrete objects, things they can feel and handle.
>
> Audio-visual materials are very useful - the numberline for example, or different kinds of games using materials.

A summary of sources of motivation in the classroom as described by the experimental subjects follows.

TABLE 9

SOURCES OF MOTIVATION IN THE CLASSROOM AS DESCRIBED BY THE EXPERIMENTAL GROUP

Source	Number of Times Mentioned
Relating work to the experiential background of the children	9
The interest and enthusiasm of the teacher	8
The use of multisensory materials	8
The knowledge by the children that they are really learning	8
The use of the "discovery method"	2

Question V: What do you think is the characteristic most needed by the good teacher?

The answers resulting from this question were remarkably clear and unambiguous. The students rarely hesitated or took any time out for thought. It seemed evident that a process of self-evaluation had been going on either consciously or unconsciously:

> Understanding. Ability to become involved with each child. Balanced judgment.
>
> Love for the children and a real desire to help them.
>
> The teacher must be dedicated, sensitive to the needs of the children.
>
> Emotionally stable if she is to lead pupils to stabilize their approach to life. Personal integrity and being physically fit.

The characteristics, as seen by the experimental subjects, as most needed by a good teacher are summarized in the following table.

TABLE 10

CHARACTERISTICS MOST NEEDED BY GOOD TEACHERS

Characteristic	Number of Times Mentioned
Understanding and love for children	16
Sense of dedication	8
Enthusiasm	7
Emotional control	6
Ability to control the children	3
Personal integrity	2
Physical fitness	1
Sense of humor-	1

A number of ideas expressed spontaneously by the experimental subjects during the final interview might well sum up the feelings and attitudes of the students as they finished the summer's rather arduous work:

> It was a wonderful opportunity to explore the likes and dislikes of children. I think I have helped some children change their attitude toward school and even toward life.
>
> I have become very conscious of the responsibility of the teaching profession.
>
> Seeing children with so many different needs has given me a sense of urgency to become a good teacher. It was wonderful to be part of a group having the same experiences. You had a chance to talk over your problems with others.

First Operational Hypothesis

Although the structured interviews yielded subjective data relevant to this study of transfer effects of a directed classroom experience, the first major supporting problem for which empirical data was sought was:

> To determine whether due to such an experience, there would be any change in personality structure of participants which would be predictive of success in student teaching.

Since the personality variables, emotional stability and sociability, were shown to have a demonstrable relationship to success in teaching, in Chapter II of this study, the problem was restated in terms of an operational hypothesis:

> The directed classroom experience as conducted in this study will produce measurable personality changes in the students participating in the experience (sociability and emotional stability).

The Gordon Personal Profile was initially administered to the entire elementary school teacher candidate population in the term immediately preceding the summer experience. It was then readministered to the experimental subjects at the end of the summer teaching session. Although the entire test was administered and scored, only the scores for sociability and emotional stability were used for the purposes of this experiment. Because a correlation already exists between two samples of scores when they represent the performance of a single group of subjects in a pretest-posttest situation, the _t_ test of significance of difference between the means of two small correlated groups was calculated. Following the procedures outlined by G. Milton Smith for such small sample groups, an important short cut was used.[1] Instead of calculating two means, two standard deviations, and the standard error of difference between the means of the two samples, a single mean only was found, the mean of the difference in the performance of the subjects before and after the introduction of the experimental factor. Hence the statistical hypothesis under such a condition, reduces to a test of whether the mean of the difference is significantly different from zero. Under the conditions of this experiment, therefore, the null hypothesis was stated thus:

$$H_0: \mu_D = 0,$$

and the alternate hypothesis:

$$H_A: \mu_D > 0.$$

---

[1] G. Milton Smith, _A Simplified Guide to Statistics_ (New York: Holt, Rinehart and Winston, Inc., 1962), pp. 84 - 88.

For purposes, therefore, of assessing the relevant personality factors in total, the averages of their combined percentile rank scores was used (See Table 11). As may be read from this table, the observed t for difference is personality scores between the pre and posttests is 3.59. Since $\underline{t}_{.01}$ for (n-1) degrees of freedom is only 2.861, the null hypothesis may be rejected and the alternate hypothesis accepted: the mean of the difference between the two tests is significantly different from zero. Since the average percentile rank scores for the character traits, emotional stability and sociability were higher for the experimental subjects after the summer teaching experience, with this difference significant at better than the 1% level of confidence, the operational hypothesis may be accepted:

> The pre-methods teaching experience, conducted under adequate supervision and with small groups of children, did produce measurable changes in the personality traits, emotional stability and sociability, of the participants.

And, as these characteristics have been shown to be strategic factors in the prediction of success in student teaching, the participants would seem more likely to succeed in their subsequent student teaching than if the experimental factor had not been interpolated.

Since the two variables are assayed separately by the Gordon Personal Profile, the two sets of percentile rank scores were examined separately for the influence of the experimental factor on each of the personality variables (See Tables 12 and 13). In the calculations of the separate means of difference for

TABLE 11

PERSONALITY CHANGES: SOCIABILITY AND EMOTIONAL STABILITY[1]

Student Code No.	Pretest Percentile Rank X	Posttest Percentile Rank Y	D (X-Y)	D^2
3	55	52.5	2.5	
7	46	73.5	-27.5	
8	48	62.5	-14.5	
9	71	78.5	-7.5	
39	16	19.5	-3.5	
44	35.5	41	-5.5	
45	59.5	75	-15.5	
47	64.5	66.5	-2.0	
50	28	50	-22.0	
51	32	46.5	-14.5	
52	27.5	18	9.5	
57	52.5	52	.5	
58	40	39.5	.5	
59	71	69.5	1.5	
63	58	63	-5.0	
66	52	53	-1.0	
67	57.5	73.5	-16.0	
71	67	71	-4.0	
75	61.5	71	-9.5	
77	60	73.5	-13.5	
n=20	$\sum X=1002.5$	$\sum Y=1149.5$	$\sum D=-147.0$	$\sum D^2=2673.5$
	$\overline{X}= 50.12$	$\overline{Y}= 57.47$	$\overline{D}= -7.37$	

$s^2 = 79.35$

$s = 8.9$

$s_{\overline{D}} = 2.046$

$t_{obs} = 3.59$[a]

$t_{.01}(19df) = 2.861$

[a] Significant at better than the 1% level of confidence.

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[1] For computational data, see Appendix III, Exhibit A.

TABLE 12

PERSONALITY CHANGES: EMOTIONAL STABILITY

Student Code No.	Pretest Percentile Rank X	Posttest Percentile Rank Y	D (X-Y)	D^2
3	96	97	-1	
7	16	66	-50	
8	72	97	-25	
9	78	70	8	
39	32	38	-6	
44	7	11	-4	
45	38	52	-14	
47	96	94	2	
50	5	6	-1	
51	0	3	-3	
52	38	19	19	
57	19	27	-8	
58	16	9	7	
59	66	48	18	
63	52	45	7	
66	11	16	-5	
67	45	83	-38	
71	83	72	11	
75	59	66	-7	
77	96	96	0	
n=20	$\sum X=925$	$\sum Y=1015$	$\sum D=-90$	$\sum D^2=5938$
	$\overline{X}= 46.25$	$\overline{Y}= 50.75$	$\overline{D}= -4.5$	

$s^2 = 276.65$

$s = 16.6$

$s_{\overline{D}} = 3.8$

$t_{obs} = 1.18^{a}$

$t_{.05}(19df) = 2.093$

---

[a] Not statistically significant.

TABLE 13

PERSONALITY CHANGES: SOCIABILITY

Student Code No.	Pretest Percentile Rank X	Posttest Percentile Rank Y	D (X-Y)	D^2
3	14	8	6	
7	76	81	-5	
8	24	28	-4	
9	64	87	-23	
39	0	1	-1	
44	64	71	-7	
45	81	98	-17	
47	33	39	-6	
50	51	94	-43	
5	64	90	-26	
5	17	17	0	
57	86	77	9	
58	64	70	-6	
59	76	91	-15	
63	64	81	-17	
66	93	90	3	
67	70	64	6	
71	51	70	-19	
75	64	76	-12	
77	24	51	-27	
n=20	$\sum X=1080$	$\sum Y=1284$	$\sum D=-204$	$\sum D^2=5416$
	$\overline{X}=54$	$\overline{Y}=64.2$	$\overline{D}=-10.2$	

$$s^2 = 166.76$$

$$s = 12.9$$

$$s_{\overline{D}} = 2.959$$

$$t_{obs} = 3.447^a$$

$$t_{.01}(19df) = 2.861$$

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[a] Statistically significant at better than the 1% level.

each of the traits individually, it was found that the variances in each separate case were larger than when the two characteristics were tested in combination. The levels of significance for differences in each case, were then correspondingly less. This result was especially noticeable in the case of the trait, emotional stability: the observed $\underline{t}$, being only 1.18, where $\underline{t}_{.05}$ for nineteen degrees of freedom is 2.093, the change in this isolated characteristic is not significantly different, but could occur by chance about twenty percent of the time. For changes in sociability, however, the observed $\underline{t}$ was 3.447, which though a little lower than that for the combined traits, is still well above the 1% level of confidence. The experimental factor, therefore, exerted a higher degree of influence on the personality variable, sociability, than on the variable, emotional stability.

Summary

Two structured interviews were held with each experimental subject, one at the beginning and one at the end of the summer teaching experience. From the answers to the questions proposed to the subjects, it seems that they themselves felt that many benefits had accrued to them from the experience: greater knowledge of children and individual differences; a more dynamic concept of teaching; a desire to know more about the teaching-learning process; a feeling for teaching as a form of dedication; and greater self-confidence. The second interview, furthermore, revealed the growth of the participants in a more generalized appreciation of those factors which, in combination, add up to a successful teacher.

The first major operational hypothesis, that the summer experience would produce measurable personality changes in the experimental subjects, was verified statistically at a level of significance higher than the 1% level of confidence. The experimental data in this study tends to support the research data presented in Chapter II on the predictive value of the traits, sociability and emotional stability.

CHAPTER V

COLLECTION AND ANALYSIS OF DATA DIRECTLY RELATED TO THE METHODS COURSE AND STUDENT TEACHING

The three problems relevant to the methods course and student teaching as originally proposed were:

1. To investigate the possibility of any significant difference in number and degree of manifest preteaching anxieties between those who had had such an experience (summer of teaching) and those who had not.

2. To discover if the directed classroom experience made any significant difference in levels of achievement in the methods course between those who participated in the experience and those who did not.

3. To investigate the extent to which any such difference carried over into differing levels of competence in student teaching.

The structure planned for investigating these questions required a design in which the methods course, including observation, would gradually blend into student teaching. A totally unique framework was, therefore, developed. According to this plan, all of senior elementary education students returned to the college campus on the first of September and, for the four remaining days of that week, met for their elementary methods class four hours a day. Two of the periods were held in the early forenoon and the other two in the early afternoon so that adequate preparation for each two hour period would be assured. During the next three weeks the students spent the morning observing in the schools to which they were assigned for their first student teaching contact. They returned, however, to the college for double sessions of their methods class in the afternoon. Thus, by the time the regular college session began, the total elementary population had already completed a major portion of their methods course, had observed direct classroom situations for thirty-six hours or more, and had participated in the work of their assigned classrooms in many minor but professional ways. The methods class continued to meet for seventy-five minutes a week throughout the entire first quarter, and until December 18 of the second. Part of the class period every other week was spent in seminar, each college supervisor taking her student teachers separately.[1]

Initially, however, in order to prevent any class or school induced fears from contaminating the results of the Pre-Teaching Anxiety Schedule, it was administered during the first meeting of the methods class in September. On the other hand, for purposes of assessing the achievement of the participants, raw scores from the objective type unit tests were accumulated throughout the course. Assessment of levels of success in student teaching were obtained, however, by securing an evaluation from each of the two sponsoring teachers for each of the student teachers who constituted either the experimental or control groups. The evaluative instrument used was the Student Teacher Rating Scale, described in Chapter III of this study. For each of these three sets of data, collected on a Posttest-Only Control Group basis, analyses of variance or covariance were calculated.

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[1] For graphic sketch of the methods-student teaching design, see Appendix I, Exhibit B.

Statistical Analyses: Terminology and Procedures

There are two general methods for controlling variability due to experimental error, direct and statistical. Direct control means, among other things, randomization, repeated measures, or grouping experimental units into homogeneous blocks by matching individuals or groups according to one or more variables which exercise bias on the fundamental variate. Since for this experiment, the students could not be assigned at random to the experimental conditions, nor could repeated measures be made at suitable time intervals, direct control was achieved by a matching process. Students who elected to gain the required credit in work with children through a summer session of small-group teaching, constituted the experimental group. Matching control group subjects, as explained in Chapter III, were drawn from the remaining population, on the basis of intelligence and achievement in past education courses. There were a number of other constants present, which also exercised direct control, such as: sex, general socio-economic background, education courses previously pursued, and relative age. Since recent research as indicated in Chapter II, has demonstrated that the personality traits of sociability and emotional stability are strategic factors in the prediction of success in teaching, these two characteristics were controlled statistically through analysis of covariance when either pre-student teaching anxieties or success in student teaching was measured. Thus, both direct and indirect controls were combined to increase the precision of the experiment and to remove potential sources of bias.

In all of the statistical analyses that follow, whether simple analyses of variance or analyses of covariance, the symbols remain constant. The procedures used are based on the rationale and procedures for single-factor experiments as developed by B. J. Winer.[1] According to this development, the criterion means are designated

$$\overline{Y}_1 \text{ and } \overline{Y}_2$$

and the covariate means

$$\overline{X}_1 \text{ and } \overline{X}_2 .$$

Two measurements are made on each of the experimental units, a measurement on the variate or criterion, Y_{ij}, and a measurement on the concomitant variate, the covariate, X_{ij}. In the notation used, T_{xx} represents n times the variation among the covariate means; E_{xx} represents the pooled within-class variation on the covariate; and S_{xx} represents the total variation for the covariate. T_{yy}, E_{yy}, and S_{yy} are, similarly , sources of variation for the criterion. Likewise, T_{xy} represents *n* times the covariation between the covariate and the criterion means; E_{xy}, the pooled within-class covariation between the covariate and the criterion; and S_{xy}, the total covariation between the covariate and the criterion.

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[1] B. J. Winer, Statistical Principles in Experimental Design (New York: McGraw-Hill Book Company, Inc., 1962).

Since analysis of covariance results from the application of a regression coefficient to obtain the reduced variate or criterion, a pooled within-class regression coefficient was used as the basic measure of rate of change between the concomitant variables. The use of the pooled within-class regression coefficient in the covariance process, however, is built upon an assumption of homogeneity of the regression coefficients within each treatment class. That is, it is based on an assumption that the effect of each treatment is constant and additive on the responses of the subjects on which the treatment is imposed. When assuming that

$$\beta_1 = \cdots = \beta_\kappa = \cdots = \beta_j = \beta,$$

the pooled estimate of β is

$$b = \frac{E_{xy}}{E_{xx}} .$$

A test of significance for homogeneity of treatment effects within-class must then be employed. Such a test involves an F ratio, the ratio of the variance of one sample to the variance of the other. For this test, the error (within-class) variation is divided into two parts: S_1, which is the variance due to residuals within class_j, and having n-1 degrees of freedom; and S_2 which is a function of the within-class regression coefficient about the pooled within-class regression coefficient. The test of homogeneity of the residual variance, therefore, has the form:

$$F = \frac{S_2/\ (k-1)}{S_1/\ (n-2)} .$$

The smaller this source of error, the more reasonable it is to assume that the within-class information from both treatment classes may be pooled to provide a single estimate of the parameter β.

In simple analysis of variance, the test is merely a test of homogeneity of variance. A relatively simple but adequate test is the Hartley test for

$$\sigma_1^2 = \sigma_2^2 = \cdots = \sigma_\kappa^2 .$$

When n is constant for all the k treatments, the hypothesis of homogeneity may be tested by the statistic

$$F_{max} = \frac{\text{largest of k treatment variances}}{\text{smallest of k treatment variances}} .$$

In either case, moderate departures from the assumption do not seriously affect the sampling distribution of the F statistic, since F tests are robust with respect to departures from homogeneity. An experimenter, therefore, need be concerned only with relatively large departures from homogeneity in the case of either variance or residual variance.

Although many formal methods for testing statistical hypotheses require that the level of significance be set in advance of obtaining the data, convention in analysis of variance is, according to Winer, somewhat opposed to this procedure:

> . . . the value of F_{obs} is generally compared with the tabled critical values, and the outcome is described in terms of the statement:[1] F_{obs} exceeds a significant percentile point . . .

This process, therefore, in which the choice of level of significance is partly determined by the observed data, will be used in all of the analyses which follow.

Analysis of Data Relevant to the Pre-Teaching Anxiety Schedule

The second operational hypothesis proposed in this experiment was concerned with the transfer effects of the directed classroom experience upon the level of anxiety with which student teachers, in general, approach their first student teaching contact. As initially stated, the hypothesis was:

> Those students who will have had this experience will manifest fewer and less intense anxieties about their student teaching.

The Pre-Teaching Anxiety Schedule was administered at the first meeting of the methods course to the entire elementary school teacher-candidate population. The varying degrees of anxiety expressed were quantified in terms of 4, 3, 2, or 1, with 4 representing the least anxiety and 1, the most. This was done in order to keep all the measures uniform as to direction. The null hypothesis, that there was no statistically significant positive difference between the experimental group and the control group, was imposed:

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[1] Winer, op. cit., p. 55.

$$H_0: \mu_1 \leq \mu_2.$$

The alternate hypothesis was, then:

$$H_A: \mu_1 > \mu_2.$$

The data resulting from the administration of the Pre-Teaching Anxiety Schedule are summarized in Table 14. The anxiety-score means (criterion means) for the experimental and control groups are designated $\overline{Y}_1$ and $\overline{Y}_2$ respectively. The covariate means for the combined scores for sociability and emotional stability are designated $\overline{X}_1$ and $\overline{X}_2$. Through the process of analysis of covariance, the influence of basic individual differences in facing social and emotional situations is controlled for a truer assessment of the socially and emotionally based expressions of anxiety. The adjusted criterion means are then designated $\overline{Y}'_1$ and $\overline{Y}'_2$. The criterion means for this single-factor experiment were 52.25 and 47.6. The pooled within-class regression coefficient being 0.154, the adjusted criterion means became 52.558 and 47.292. The observed F ratio, after correcting for linear effect of the covariate, was 12.95. (See Table 15.) The critical value for a .01-level test in this case is $F_{.99}(1,37) = 7.37$. The observed F, therefore, of 12.95 rejects the null hypothesis, and the alternate hypothesis of significance of difference, even after

TABLE 14

RAW SCORE DATA: ANALYSIS OF COVARIANCE
PRE-TEACHING ANXIETY SCHEDULE

Experimental Group			Control Group		
Student Code No.	Emotional Stability and Sociability X_1	Anxiety Scores Y_1	Student Code No.	Emotional Stability and Sociability X_2	Anxiety Scores Y_2
3	48	48	41	48	51
7	44	56	26	44	54
8	45	51	72	49	44
9	53	51	33	47	50
39	25	44	84	54	51
44	38	55	88	44	45
45	50	57	4	59	52
47	53	50	14	52	44
50	35	50	13	33	44
51	31	53	6	35	49
52	38	47	54	50	52
57	47	55	5	48	45
58	42	55	12	52	36
59	53	60	65	39	46
63	49	54	61	50	42
66	46	54	79	54	45
67	49	52	46	52	54
71	52	54	49	60	53
75	50	51	42	54	56
77	51	48	10	55	49

$n_1 = 20$ $T_{X_1} = 899$ $T_{Y_1} = 1045$ $n_2 = 20$ $T_{X_2} = 979$ $T_{Y_2} = 952$

$\sum XY_1 = 47194$ $\sum XY_2 = 46710$

$\sum X_1^2 = 41587$ $\sum Y_1^2 = 54877$ $\sum X_2^2 = 48891$ $\sum Y_2^2 = 45828$

$\overline{X}_1 = 44.95$ $\overline{Y}_1 = 52.25$ $\overline{X}_2 = 48.95$ $\overline{X}_2 = 47.6$

$N = 40$ $\overline{X} = 46.95$ $b = .154$ $\overline{Y}_1' = 52.558$ $\overline{Y}_2' = 47.292$

adjustment is made for linear effect of the covariate, may be accepted.[1]

TABLE 15

SUMMARY OF DATA FOR THE ANALYSIS OF COVARIANCE WITH RESPECT TO THE PRE-TEACHING ANXIETY SCHEDULE

Source	SS	df	MS	F
Analysis of Variance				
Total: S_{yy}	1004.775	39		
Error: E_{yy}	788.55	38	20.75	10.42
Treatments: T_{yy}	216.225	1	216.225	
Analysis of Covariance				
Total: S'_{yy}	995.676	38		
Error: E'_{yy}	737.541	37	19.993	12.95*
Treatments: T_{yy_R}	258.135	1	258.135	

*$F_{.99}(1,37) = 7.37$

To test the assumption of homogeneity of within-class regression, S_1 and S_2 were found to be 734.65 and 2.89 respectively. Using the formula

$$F = \frac{S_2/(k-1)}{S_1/k(n-2)},$$

with (1,36) degrees of freedom, $F_{obs} = .14$. Since any F ratio less than one is always non-significant, the experimental data do not contradict the assumption of homogeneity, and the outcome of this test does not rule against pooling the within-class regressions.

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[1] For computational data, see Appendix III, Exhibit B.

In an effort to discover which of the anxieties were most effectively reduced by the pre-methods, pre-teaching experience, an analysis of covariance was calculated for each of the separate items on the anxiety questionnaire. The results of the separate analyses follow, with the items condensed into titles.

TABLE 16

F RATIOS OF SEPARATE ANXIETY ITEMS

Area of Anxiety	F Ratios
Fear of the group	19.309
Discipline	10.05
Knowing right technique	9.374
Interest and attention	8.227 *
Bulletin boards	6.247
Children understanding me	5.714 **
Needs of children	3.923
Keeping records	3.115
College supervisor	2.792
Liked by children	2.718
Sufficient knowledge	2.667
Sponsoring teacher	1.149
Children's questions	.718
Looking too young	.577
Keeping time limits	.037
Meeting school faculty	.002

*Significant at better than the 1% level.
**Significant at better than the 5% level.

A further, non-quantitative comparison was made to determine the hierarchy of anxieties within each group. In the following table a rank of one indicates the greatest degree of anxiety and a rank of sixteen, the lowest.

TABLE 17

COMPARISON OF ORDER AND DEGREE OF ANXIETY BETWEEN THE EXPERIMENTAL AND THE CONTROL GROUPS

Experimental Group		Control Group	
Area of Anxiety	Rank	Area of Anxiety	Rank
Meeting needs of children	1	Discipline	1
Discipline	2	Right technique	2
Interest and attention	3	Needs of children	3
College supervisor	4.5	Interest and attention	4.5
Right technique	4.5	College supervisor	4.5
Meeting faculty	6	Children understand me	6
Children understand me	8	Sufficient knowledge	7.5
Sufficient knowledge	8	Children's questions	7.5
Children's questions	8	Fear of the group	9
Time limits	10	Bulletin boards	10
Sponsoring Teacher	11	Meeting faculty	11
Looking too young	12	Sponsoring teacher	12
Liked by children	13.5	Time limits	13
Keeping records	13.5	Liked by children	14.5
Fixing bulletin boards	15	Looking too young	14.5
Fear of the group	16	Keeping records	16

The experimental-group results showed a radical departure from the results of all other groups to whom the questionnaire had been administered, in that fear about classroom order was not given first place. Likewise, "Fear of standing before a group," dropped from a consistent rank of nine to last place.[1] This same item yielded the greatest degree of significance of difference between the two groups of any of the anxiety items considered.

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[1] See Table 3, page 37 of this study.

Analysis of Data with Respect to the Methods Course

The third operational hypothesis proposed in this experiment was concerned with the transfer effects of the directed classroom experience to achievement in the elementary school methods course. The verbal statement of the hypothesis was:

> Those students who have participated in the pre-methods directed classroom experience will manifest higher levels of achievement in the subsequent elementary methods course.

Objective type unit tests were, therefore, administered at the end of each of the five units of work to the entire population.[1] Raw scores from these tests were cumulated for both the experimental and the control groups. Since the two groups were already closely matched as to general ability and previous achievement in education courses, and since the combined traits, sociability and emotional stability, have not been demonstrated to have any necessarily strategic influence on specific achievement, a simple analysis of variance was used. Although the _t_ test of significance would have sufficed for the comparison of means in this case, analysis of variance was used in order to keep all the symbols constant. Therefore, as in the previous analysis of covariance, the data to be tested was designated Y_j, and the data mean, $\overline{Y}_j$. (See Table 18.)

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[1] For complete set of unit tests, see Appendix II, Exhibits G, H, I, J, and K.

TABLE 18

RAW SCORE DATA: ANALYSIS OF VARIANCE[1]
UNIT TESTS

Experimental Group		Control Group	
Student Code No.	Unit Tests Scores	Student Code No.	Unit Tests Scores
3	99	41	90
7	99	26	84
8	108	72	73
9	91	33	87
39	76	84	94
44	96	88	83
45	101	4	97
47	101	14	72
50	114	13	78
51	90	6	81
52	96	54	87
57	95	5	91
58	90	12	64
59	87	65	76
63	101	61	72
66	90	79	88
67	94	46	83
71	109	49	100
75	100	42	82
77	97	10	65

$n_1 = 20$ $T_{Y_1} = 1934$ $n_2 = 20$ $T_{Y_2} = 1147$

$\sum Y_1^2 = 188374$ $\sum Y_2^2 = 137505$

$\overline{Y}_1 = 96.7$ $\overline{Y}_2 = 82.35$

$N = 40$

---

[1] For computational data, see Appendix III, Exhibit C.

The null hypothesis that there was no statistically significant positive difference between the achievement of the experimental group and that of the control was imposed:

$$H_0 : \mu_1 \leq \mu_2 .$$

The alternate hypothesis was, then:

$$H_A : \mu_1 > \mu_2 .$$

The means for the experimental and control groups were 96.7 and 82.35 respectively. The observed F was 24.22, whereas $F_{.9999}(1,38)$ is 18.953. The null hypothesis of no difference may then be rejected and the alternate hypothesis of significance of difference between the means may be accepted.

TABLE 19

SUMMARY OF DATA FOR ANALYSIS OF VARIANCE WITH RESPECT TO ACHIEVEMENT IN THE METHODS COURSE

Source	SS	df	MS	F
Total	$S_{yy} = 5289.98$	39		
Error	$E_{yy} = 2320.75$	38	85.01	24.22*
Treatments	$T_{yy} = 2059.23$	1	2059.23	

$^*F_{.9999}(1,38) = 18.953$

In testing for homogeneity of variance, that

$$\sigma_1^2 = \sigma_2^2 ,$$

the formula proposed by Winer as derived from Hartley was used:[1]

$$F_{max} = \frac{s^2 \text{ largest}}{s^2 \text{ smallest}}$$

Since the number of the treatments in this case was only two, the respective variances for the two groups were used and the formula reduced to

$$F_{max} = \frac{99.66}{71.37} = 1.39,$$

As the degrees of freedom indicated in the use of this formula and the F_{max} table are k and n-1, where n symbolizes the number in each of the separate classes and, since $F_{max\ .95}(2,19)$ is 2.56, the experimental data do not contradict the assumption of homogeneity of variances.

Analysis of Data with Respect to the Student Teaching Ratings

The fourth and last operational hypothesis as stated was:

> These same students (the experimental subjects) will demonstrate higher levels of teaching competence in their student teaching experience.

The Student Teacher Rating Scale, described in Chapter III, was submitted to each of the sponsoring teachers who directed the work of each of the student teachers in their consecutive student teaching contacts.[2] The assignment of the student teachers to the respective sponsoring teachers was done in the main education office and was based on student preferences as to the availability of schools and transportation facilities. As far as this study was concerned the assignments were thus on a relatively random basis, since there was no attempt to match student and sponsoring teacher. The various degrees of competence for each of the twenty-five descriptions of critical behaviors as listed in the rating scale, were quantified in terms of 4, 3, 2, and 1. The highest degree was symbolized by 4 and the lowest by 1. Since for each of the students involved there were two sets of ratings, one for the first quarter and one for the second, three separate covariance analyses were made: one for each of the two quarters and one for the cumulative ratings of both quarters.

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[1] Winer, op. cit., p. 93.

[2] See Student Teacher Rating Scale, Appendix II, Exhibit L.

The data resulting from the rating scales as submitted for the first quarter are summarized in Table 20. The covariate data (combined scores for Sociability and Emotional Stability) remained the same as in the initial covariance table. The $\underline{n}$ in this case, however, had to be reduced to nineteen, as experimental subject 47 had to withdraw from student teaching due to a prolonged illness. The data for her matched control subject, 14, was likewise withdrawn from this analysis and from the two following analyses. The respective quantitative data from the Student Teacher Rating Scale for each of the thirty-eight students now involved, constituted the criterion data. The null hypothesis that there was no statistically significant positive difference between the experimental group and the

TABLE 20

RAW SCORE DATA FOR ANALYSIS OF COVARIANCE
STUDENT TEACHER RATING SCALE: FIRST QUARTER

Experimental Group			Control Group		
Student Code No.	Emotional Stability and Sociability X_1	Rating Scale Y_1	Student Code No.	Emotional Stability and Sociability X_1	Rating Scale Y_1
3	48	90	41	48	83
7	44	83	26	44	90
8	45	70	72	49	81
9	53	84	33	47	91
39	25	89	84	54	79
44	38	92	88	44	38
45	50	86	4	59	90
50	35	94	13	33	84
51	31	87	6	35	89
52	38	71	54	50	82
57	47	77	5	48	59
58	42	74	12	52	64
59	53	99	65	39	86
63	49	82	61	50	83
66	46	98	79	34	83
67	49	84	46	52	80
71	52	86	49	60	90
75	50	96	42	54	78
77	51	87	10	55	78

$n_1 = 19$ $T_{X_1} = 846$ $T_{Y_1} = 1629$

$\sum XY_1 = 72605$

$\sum X_1^2 = 38778$ $\sum Y_1^2 = 140943$

$\overline{X}_1 = 44.52$ $\overline{Y}_1 = 85.73$

$n_2 = 19$ $T_{X_2} = 927$ $T_{Y_2} = 1508$

$\sum XY_2 = 73633$

$\sum X_2^2 = 46187$ $\sum Y_2^2 = 122736$

$\overline{X}_2 = 48.78$ $\overline{Y}_2 = 79.36$

$N = 38$ $\overline{X} = 46.65$ $b = .062$ $\overline{Y}_1' = 85.862$ $\overline{Y}_2' = 79.228$

control group was imposed:

$$H_0: \mu_1 \leq \mu_2.$$

The alternate hypothesis was, then,

$$H_A: \mu_1 > \mu_2.$$

The covariate means for the lowered n_1 and n_2 became 44.52 and 48.78 respectively. The criterion means were 85.73 and 79.36. The pooled within-class regression coefficient being only .062, the reduced criterion means were 85.862 and 79.228.

TABLE 21

SUMMARY OF DATA FOR THE ANALYSIS OF COVARIANCE WITH RESPECT TO THE STUDENT TEACHER RATING SCALE: FIRST QUARTER[1]

Analysis of Variance

Source	SS	df	MS	F
Total: S_{yy}	4711.395	37		
Error: E_{yy}	4326.107	36	120.169	3.206*
Treatments: T_{yy}	385.288	1	385.288	

Analysis of Covariance

Source	SS	df	MS	F
Total: S'_{yy}	4704.104	36		
Error: E'_{yy}	4317.912	35	123.369	3.13*
Treatments: T'_{yy_R}	386.192	1	386.192	

*$F_{.95}(1,35) = 4.12$

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[1] For computational data, see Appendix III, Exhibit D.

The reduced F ratio, after correcting for the linear effects of the covariate was 3.13. Since the critical value for a .05-level test in this case is $F_{.95}(1,35) = 4.12$, the observed F, although indicating a positive difference in favor of the experimental group, does not reject the null hypothesis. The alternate hypothesis of significance of difference could not, therefore, be accepted.

In testing the homogeneity of the within-class regression, S_1 and S_2 were found to be 8.191 and .006. The $F_{obs} = .00006$ and, since any F ratio less than one is always non-significant, the outcome of this test does not rule against the use of the pooled within-class regression coefficient.

The data resulting from the student teacher ratings as submitted for the second quarter are summarized in Table 22. The null hypothesis of no positive significant difference was again imposed:

$$H_0: \mu_1 \leq \mu_2,$$

and the alternate hypothesis:

$$H_A: \mu_1 > \mu_2.$$

The criterion means for the second quarter ratings were 87.1 and 78.31. The pooled within-class regression coefficient being only 0.067, the reduced means differed very little from the original criterion means: 87.234 and 78.175 respectively. The observed F ratio, after correcting for linear effects of the covariate data, was 11.551. Since the critical value for a .01-level test in this case is $F_{.99}(1,35) = 7.415$, the null

TABLE 22

RAW SCORE DATA FOR ANALYSIS OF COVARIANCE STUDENT TEACHER RATING SCALE: SECOND QUARTER

Experimental Group			Control Group		
Student Code No.	Emotional Stability and Sociability X_1	Rating Scale Y_1	Student Code No.	Emotional Stability and Sociability X_1	Rating Scale Y_1
3	48	88	41	48	85
7	44	87	26	44	73
8	45	87	72	49	79
9	53	86	33	47	84
39	25	91	84	54	80
44	38	96	88	44	71
45	50	97	4	59	78
50	35	93	13	33	82
51	31	89	6	35	76
52	38	72	54	50	76
57	47	72	5	48	64
58	42	68	12	52	62
59	53	95	65	39	86
63	49	83	61	50	81
66	46	90	79	54	80
67	49	86	46	52	87
71	52	95	49	60	90
75	50	91	42	54	81
77	51	89	10	55	73
$n_1 = 19$	$T_{X_1} = 846$	$T_{Y_1} = 1655$	$n_2 = 19$	$T_{X_2} = 927$	$T_{Y_2} = 1488$
	$\sum XY_1 = 73773$			$\sum XY_2 = 72656$	
$\sum X_1^2 = 38778$		$\sum Y_1^2 = 145383$	$\sum X_2^2 = 46187$		$\sum Y_2^2 = 117508$
$\bar{X}_1 = 44.52$		$\bar{Y}_1 = 87.1$	$\bar{X}_2 = 48.78$		$\bar{Y}_2 = 78.31$

$N = 38$ $\bar{X} = 46.65$ $b = .067$ $\bar{Y}'_1 = 87.234$ $\bar{Y}'_2 = 78.175$

hypothesis may be rejected and the alternate hypothesis of significance of difference, accepted.[1]

TABLE 23

SUMMARY OF DATA FOR THE ANALYSIS OF COVARIANCE WITH RESPECT TO THE STUDENT TEACHER RATING SCALE: SECOND QUARTER

Source	SS	df	MS	F
Analysis of Variance				
Total: S_{yy}	2931.816	37		
Error: E_{yy}	2197.896	36	61.052	12.021
Treatments: T_{yy}	733.920	1	733.92	
Analysis of Covariance				
Total: S'_{yy}	2910.846	36		
Error: E'_{yy}	2188.525	35	62.529	11.551*
Treatments: T_{yy_R}	722.321	1	722.321	

$^*F_{.99}(1,35) = 7.415$

S_1 and S_2 were found to be 2164.62 and 23.905 respectively. Using the same formula as above for the F Ratio in testing homogeneity, F_{obs} was .375 for (1,34) degrees of freedom. Again, the ratio being less than one, there was no evidence contradicting the assumption of homogeneity or the use of the pooled within-class regression coefficient.

In order, however, to assess the significance of difference for total indices of teaching competency between the experimental and control groups, the ratings for both quarters were combined. The covariate data remaining the same, the totaled criterion means were 172.84 and 157.684. (See Table 25 for raw score data.) A final null hypothesis was imposed:

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[1] For computational data, see Appendix III, Exhibit E.

$$H_0: u_1 \leq u_2,$$

and its alternate hypothesis:

$$H_A: u_1 > u_2.$$

The residual effects were very slight because of the low regression coefficient -- 0.13. Therefore, after correcting for the linear effects of the covariate data, the reduced means were 173.102 and 157.424.

TABLE 24

SUMMARY OF DATA FOR ANALYSIS OF COVARIANCE WITH RESPECT TO STUDENT TEACHING RATING SCALE: SEMESTER TOTALS

Source	SS	df	MS	F
Analysis of Variance				
Total: S_{yy}	12657.369	37		
Error: E_{yy}	10474.633	36	290.962	7.501*
Treatments: T_{yy}	2182.736	1	2182.736	
Analysis of Covariance				
Source: S'_{yy}	12604.376	36		
Error: E'_{yy}	10439.559	35	298.273	7.257*
Treatments: T_{yy_R}	2164.817	1	2164.817	

$^{*}F_{.95}(1,35) = 4.12$

TABLE 25

RAW SCORE DATA FOR ANALYSIS OF COVARIANCE
STUDENT TEACHER RATING SCALE: SEMESTER TOTALS

Experimental Group			Control Group		
Student Code No.	Emotional Stability and Sociability X_1	Rating Scale Y_1	Student Code No.	Emotional Stability and Sociability X_2	Rating Scale Y_2
3	48	178	41	48	168
7	44	170	26	44	163
8	45	157	72	49	160
9	53	170	33	47	175
39	25	180	84	54	159
44	38	188	88	44	109
45	50	183	4	59	168
50	35	187	13	33	166
51	31	176	6	35	165
52	38	143	54	50	158
57	47	149	5	48	123
58	42	142	12	52	126
59	53	194	65	39	172
63	49	165	61	50	164
66	46	188	79	54	163
67	49	170	46	52	167
71	52	181	49	60	180
75	50	187	42	54	159
77	51	176	10	55	151
$n_1 = 19$	$T_{X_1} = 846$	$T_{Y_1} = 3284$	$n_2 = 19$	$T_{X_2} = 927$	$T_{Y_2} = 2996$
	$\sum XY_1 = 146378$			$\sum XY_2 = 146289$	
$\sum X_1^2 = 38778$		$\sum Y_1^2 = 571936$	$\sum X_2^2 = 46187$		$\sum Y_2^2 = 478574$
$\bar{X}_1 = 44.52$		$\bar{Y}_1 = 172.842$	$\bar{X}_2 = 48.78$		$\bar{Y}_2 = 157.684$
N = 38	$\bar{X} = 46.65$	b = .13	$\bar{Y}'_1 = 173.102$		$\bar{Y}'_2 = 157.424$

The final F ratio, after correcting for linear effects, was 7.257. Since $F_{.95}(1,35)$ is 4.12, the observed F was well above the critical value for .05-level of significance, and very slightly below 7.415, the .01-level. Once more the test for homogeneity of treatment effects produced an F ratio less than one (.0005342) and, hence, non-significant.[1]

Summary

Analyses of variance or covariance were calculated to test for any significance of difference between the experimental and control groups with respect to pre-teaching anxieties, achievement in a methods course, and competency in student teaching. For both the pre-teaching anxieties and the student teaching ratings, the strategic personality variables for success in teaching were held constant through covariance procedures. In assessing significance of difference in achievement in the methods course, simple analysis of variance was used, since the groups were already matched as to general ability and specific achievement.

Levels of significance well above the .01-level were observed for differences in pre-teaching anxieties, achievement in the methods course, and the second quarter student teaching competency. Due to extreme variations in first quarter student teaching ratings, the differences were positive but not significant. Although totaling the ratings of the two quarters lessened the degree of variation, the total semester ratings were significant at only the .05-level of confidence.

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[1] For computational data, see Appendix III, Exhibit F.

Separate and individual analyses for each of the items in the Pre-Teaching Anxiety Scheduel revealed that four specific anxieties were discriminative items in the reduction of pre-teaching anxieties: fear of standing before a group; anxiety about classroom order; anxiety about the use of the right teaching technique; and fear of not being able to hold the interest and attention of the children.

CHAPTER VI

CONCLUSIONS, LIMITATIONS, AND IMPLICATIONS

Resume

The purpose of this experiment was to investigate the possibility of transfer effects existing between an informal but directed classroom experience, initiated prior to a methods course, and achievement in that methods course and in student teaching.

Twenty students who had completed their third year in college and who were currently preparing for an elementary school certificate, were given the opportunity to earn a required credit in Directed Laboratory Work with Children during the summer session at Marygrove College. Under adequate supervision, they conducted small-group classes in reading and arithmetic for two hours each day of a six weeks session. These experimental subjects were group-matched to a control group on the basis of general ability and achievement in previous education courses. Transfer effects were measured through the use of two standardized instruments, two original instruments, and five objective type unit tests.

In measuring the transfer effects of the directed experience upon the personality structure of each of the experimental subjects, a pretest-posttest design was followed in which a *t* test of significance was employed. Measurement of transfer effects in the areas of pre-teaching anxieties, achievement in the methods course, and competency in student teaching was accomplished through analyses of covariance on a posttest-only control group basis.

Conclusions and Interpretations

The results of the analysis of data with respect to the possibility of changes in personality structure due to the directed classroom experience involved in this study seem to warrant the following conclusions:

1. That such an experience, initiated prior to a methods course, can significantly raise the combined scores for the personality traits of emotional stability and sociability as measured by the Gordon Personal Profile.
2. That since these characteristics, in the light of recent research, have been demonstrated to be strategic personality factors in the prediction of success in teaching, the directed experience would seem to have played a significant part in raising the personality potentials of the participants for success in student teaching.
3. That this implementation of personality factors is more evident in the area of sociability than in emotional stability.

Since the experimental subjects, throughout the six weeks of informal teaching, were in very close contact with small groups of children, worked closely with their supervisors, and often consulted with the parents of the children, there was evident ample opportunity for the development of their social faculties. The lesser growth in emotional stability of the students in this study may be due to their inexperience and lack of training since they often made mistakes in both the teaching-learning process and in the interpersonal teacher-pupil exchange.

The results of the analysis of data with respect to pre-teaching anxieties indicate that:

1. Under the conditions of this study, an independent experience with children in a classroom situation, prior to both a methods course and student teaching, significantly reduces the specific anxieties of those who are entering student teaching.

2. This reduction of anxiety is most marked in the areas of: fear of standing before a group; anxiety about keeping order in the classroom; anxiety about the use of proper teaching techniques; and anxiety about their ability to hold the interest and attention of the children.

3. The same experience made the participants more sensitive to the actual area in which there is a realistic basis for anxiety -- the ability to meet the needs of the individual children.

After dealing with eight to ten children only, and having discovered that each child constitutes practically a class of one, the experimental subjects manifested, in their final structured interview, a unanimous consensus that appreciation of individual differences constituted their greatest gain with respect to knowledge of children. But further than this the total tone of the final interviews indicated that:

1. The students who had this experience would come to their methods course with a number of generalizations about methods and materials, motivation and individualization already formed.

2. Having been obliged to discover some few of these principles of teaching and learning on their own, they were openly anxious to pursue their methods course with personalized and well-focused objectives in mind.

The results of the analysis of data with respect to achievement in the methods course corroborated the predictions indicated by the results of the interviews. The degree of difference between the experimental group and the control group was so highly significant statistically that the objective bases of this part of the experiment need to be re-emphasized:

1. The experimental subjects did not know that they were part of an extended study or experiment, or that they were being compared in any way with any other group.

2. To preserve objectivity on the part of the instructor, who was also the director of the experiment, a classroom assistant and a curriculum materials assistant were procured to aid in the direction of the class itself.

3. To further procure objectivity, the course was preplanned entirely and outlines of the complete course were given to every student.

4. And, as a final check on objectivity, the raw scores of the five objective type unit tests were used as the basis of the statistical analysis.

The results of the analysis of data with respect to competency in student teaching indicate that:

1. Those who had the pre-methods, pre-student teaching experience with children in an instructional situation did manifest greater competency significant at a .05-level of confidence for the entire semester.

2. Since the competency was less in the first quarter but increased measurably in the second, it would seem that the transfer effects of the directed classroom experience were dynamic in nature and capable of producing longer lasting, additive results.

In interpreting the results of the ratings on the Student Teacher Rating Scale, it is important to note that from sponsoring teacher to sponsoring teacher there were some recurring differences due to the human elements involved. Some sponsoring teachers gave consistently higher ratings for both quarters, even when they were rating someone who in the first quarter had received very low ratings. Others, however, gave consistently lower ratings. Since there was no effort made to pair any given student teacher with any given sponsoring teacher, control subjects, experimental subjects, and student teachers from the remainder of the population were considerably mixed in the reassignments of the second quarter. Furthermore, no attempt was made to control statistically, the evident fact that some of the sponsoring teachers who were directing the students in their student teaching were consistently high or low in their rating procedures.

Limitations

In any attempt to extend the findings and interpretations of this experiment certain limitations must be considered:

1. That the experiment was extremely local in nature, being confined to one college, to young women only, and to one particular type of directed experience.
2. That the number of experimental subjects involved was small, twenty for the major part of the experiment and nineteen for the student teacher facet.
3. That the normal human element operative in any rating situation was present in a strong measure in the ratings of the student teachers by their sponsoring teachers. And, that beyond a letter of explanation, the sponsoring teachers had no specific training in the use of the rating scale.

Implications

Certain practical applications for teacher education seem to be implicit to the conclusions of this experiment. One is that highly theoretical facets of theory become more comprehensible and more readily applicable to the student who has been made to feel his lacks in this area through a fairly independent laboratory experience with children. That, therefore, a directed but rather informal experience with children, immediately preceding a methods course, could be the focusing agent for the whole course. It could also provide intrinsic motivation for the acquisition of those knowledges and techniques which are basic to success in teaching.

A second implication lies in the possibility of the elimination of some of the unnecessary anxieties with which a student teacher approaches children, the sponsoring teacher, and the whole new world of bulletin boards, chalk dust, and audio-visual equipment through an early classroom experience. The whole study seems to point to the fact that such an early exposure to instructional situations provides opportunity for earlier professional maturation.

More explicitly, however, this study points to the responsibility of those in administration to provide opportunities for an extended classroom encounter at a point in the educational program where the student has had sufficient psychology to give him a basis for evaluation of his own needs and lacks. It would devolve on the same administration to provide further theoretical course work after the experience in which the student can attempt, on a self-evaluative basis, to remedy those lacks.

In the light of the problems experienced in trying to obtain objective evaluations from the sponsoring teachers, the results of this experiment also seem to imply a need for the teacher training institution to accept a greater amount of responsibility, not only in the selection of the sponsoring teachers, but also in the in-service training of these same semi-official members of the college or university.

Further Research

Since this experiment, however, was so restricted in numbers and so local in nature, its results, although reasonable, should be verified through replication on a larger scale, using students of more diverse backgrounds and from different areas of the country. Likewise, an exploration of the professional potential of a directed classroom experience provided simultaneously with the methods course should be attempted.

More concretely, however, as the results of this experiment point toward the possibility of a dynamic or spiraling effect of the initial directed experience, the current subjects, both experimental and control, will be followed through their first year of independent teaching. A further statistical analysis will then be made of their relative competence and potential for professional growth as manifested through the ratings of their respective first-year principals.

APPENDIX I

ORIENTATION MATERIAL

EXHIBIT A

AUDIO-SLIDE SEQUENCES

1. Presenting and Drilling New Words in Context
2. Conducting Silent Guided Reading
3. Motivating and Improving Oral Reading Through the Use of the Tape Recorder
4. Motivating and Improving both Silent Comprehension and Oral Reading Through the Use of Filmstrips
5. Teaching Work Attack Skills: Phonetic Analysis
6. Developing Related Number Facts
7. Using the Number Line for Addition, Subtraction, Multiplication, and Division
8. Developing Recognition of Fractional Equivalents
9. Developing Addition of Unlike Fractions
10. Action of Numbers in the Verbal Problem

EXHIBIT B

GRAPHIC SKETCH OF METHODS-STUDENT TEACHING DESIGN

September 1964

S	M	T	W	T	F	S		Class Hours	Laboratory
		1	2	3	4	5	....	16	
6	7	8/	9/	10/	11/	12	....	8	12/2 = 6
13	14/	15/	16/	17/	18	19	....	8	12/2 = 6
20	21	22	23	24	25	26		32	12
27	28	29	30						

Total: 44 hours

Further Classes

September 25
October 2, 9, 16, 23, 30
November 6, 13, 20
December 4, 11, 18

Twelve seventy-five minute
periods: one each week:
or
18 class hours

Total: 62 class hours
4 credit hours

Legend for September Calendar

— Class Time: double periods
= Class Time: four periods
/ Laboratory: observation in school situations

Student teaching observation as such began the week of September 21. Thereafter, half of the class period every other week was devoted to seminar, each college supervisor taking her particular student teachers for special discussion and sharing.

APPENDIX II

STANDARDIZED AND ORIGINAL INSTRUMENTS

EXHIBIT A

Form 1

Shortened Edition

George Washington University Series

TEACHING APTITUDE TEST

Prepared by F. A. Moss, T. Hunt, and F. C. Wallace
in cooperation with various educators

Name....................................

....

....

Test	Method of Scoring	Total Possible	Score
1	Number right × 2	60	
2	Rights—Wrongs	80	
3	Rights—Wrongs	20	
	Total	160	

Directions: Do not turn the page until told to do so. Follow the directions before each test.

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1835 Eye Street, N.W.
Washington 6, D. C.

TEST 1—JUDGMENT IN TEACHING SITUATIONS

Directions: For each of the following questions four answers are suggested. Read over the four answers and then place a check (√) on the line before the answer which is the best or most nearly correct. Do not place a check before more than one answer.

1. Your supervisor unexpectedly comes into your classroom. If you were the teacher, you should:
——Present some of your difficulties for him to solve.
——Explain that some of the children always make a poor showing before strangers.
——Do your best without comment.
——Ask the supervisor to take charge of the class.

2. The janitor insolently disagrees with the teacher over a question of classroom ventilation. The teacher should:
——Report the matter to the principal, giving all the facts of the case.
——Endeavor to gain the janitor's good will with a generous tip.
——Allow the janitor to handle the ventilation question as he sees fit.
——Tell the janitor that it is her room and that she will ventilate it as she pleases.

3. A teacher has signed a contract for a position. During the early summer she is offered a more attractive one elsewhere. She should:
——Resign and accept the better position.
——Ask to be released from the contract.
——Refuse the better position and keep the contract.
——Recommend a person qualified to take her place.

4. Young children like best games which call for:
——Endurance.
——Initiative.
——Rhythm and repetition.
——Skill.

5. The mother of one child in your room is particularly fussy. You should:
——Give the child special attention.
——Try to make the mother see that she is wasting her time and yours.
——Avoid giving the pupil poor marks.
——Keep to your program.

6. A child is very timid and becomes very much embarrassed when attempting to recite. The teacher should:
——Encourage the child whenever he recites.
——Have the child stand before the class to recite.
——Keep the child after school and allow him to recite alone.
——Allow the child to sit in his seat rather than stand when he recites.

7. You have difficulties with your principal. It would be best for you to:
——Give the facts to parents and teachers for your own protection.
——Have a talk with the principal.
——Get the advice of fellow teachers.
——Register the complaint with the school board.

8. A bright pupil is a source of annoyance in your classroom. You should:
——Send a note home to his parents.
——Give him some extra work that appeals to him.
——Send him to the principal for discipline.
——Take the arrogance out of him by giving him some work that he cannot do.

9. If a child's parents protest his marks the teacher should:
——Find out whether the child thinks he has been marked unfairly.
——Refer the matter to the principal.
——Show the parents the child's record.
——Give the child a special examination.

10. When a fellow teacher tells you that a pupil whom you have formerly had in a class knows nothing of the work which you have been supposed to teach, you should:
——Tell her that the pupil was good when you had him.
——Tell her you are sorry but hope that she will be able to teach him something.
——Send for the pupil and coach him a few times.
——Have a conference with the teacher and discuss the pupil's special needs.

11. John is a self-conscious boy who always remains on the fringe of the social life of the school. It would be best to:
——Allow him to do the little extra jobs around the classroom since he does not like to play.
——Draw him into the games of the children.
——Have a talk with his parents.
——Let him shift for himself as he will learn sooner or later.

12. A group of six girls in your class ask you to go on a picnic with them at a time when you are busy. It would be best to:
——Tell them that you are too busy to go.
——Tell them that you think they would have a better time without you.
——Suggest someone else who might like to go.
——Arrange to go with them at another time.

13. A principal finds it necessary to assign a class in mathematics to a teacher who is employed to teach geography. It would be best for the teacher to:
——Arrange for one of the other teachers to teach the mathematics.
——Present the case to the superintendent.
——Ask for fewer classes if she accepts the mathematics class.
——Teach it.

14. On the first of April a group of children bring you what purports to be a box of candy but which is a box of sand. It would be best for you to:
——Tell the class your opinion of practical jokes.
——Say nothing but let your manner indicate your disapproval.
——Take the whole affair as a joke.
——Try to get even with a joke on them.

15. You catch a fourth grade pupil cheating for the first time. You should:
——Deny him promotion.
——Reprimand him before the class.
——Send him to the principal.
——Talk to him after school.

16. A child in the primary grades comes to school with extremely dirty hands. It would be best to:
——Impress upon him the danger of disease from dirty hands.
——Refuse to allow him to use any school materials.
——Report the child to the school nurse.
——Send him to wash his hands.

TEST 1—JUDGMENT IN TEACHING SITUATIONS—Continued

17. If a child is late to school every morning, it would be best for the teacher to:
———Investigate home conditions.
———Punish the child.
———Send the child to the principal.
———Send the child for a note from his parents.

18. Your class has been giving you trouble with discipline. It would be best to:
———Make a plea to the children to behave.
———Threaten to punish those who do not behave.
———Study the methods of other teachers.
———Invite the principal to talk to the children.

19. Two mothers come to the teacher with their own interpretation of a quarrel on the playground between their children. The teacher should:
———Allow the mothers to settle the difficulty.
———Report the case to the principal.
———Punish both children in the same manner.
———Call together the parties involved and try to get the facts.

20. A child in your class cannot get along with the other children. He teases them, takes away their pencils, and gets into fights with them. What is the best way to discipline him?
———Keep him after school.
———Send him home when he misbehaves.
———Give him something to do that will create in him a sense of responsibility.
———Do not let him participate in the games.

21. If you discover a fire in the building where you are teaching, the first thing for you to do is to:
———Get word to the principal.
———Ask a boy to turn in a fire alarm.
———See that the fire-drill bell is rung.
———Tell the children to hurry out of the building.

22. A student brings in a forged note purporting to be from his mother, excusing him from absence on the previous day. The teacher should:
———Warn the class against such practices.
———Let the matter pass with a warning that a recurrence will bring punishment.
———Report the case to the principal.
———Talk the matter over with the child's mother showing the note.

23. You have been unable to adjust a difficulty between two students who have repeatedly complained about sitting next to each other. It would be best to:
———Change the pupils' seats.
———Communicate with the pupils' parents.
———Refuse to change your original seating plan.
———Tell the children that they should learn to get along with others.

24. During the class period while you are explaining a lesson to a fifth grade, a circus parade passes your windows. You should:
———Allow the children to go to the windows.
———Continue the class work ignoring the parade.
———Reprimand the children for their restlessness.
———Have the children stand and go through setting up exercises.

25. If a supervisor questions a teacher's judgment in a matter, the teacher should:
———Explain her stand in the matter.
———Submit to the judgment of the supervisor.
———Defend her own judgment.
———Call in an authority to settle the matter.

26. If a bright pupil in the third grade insists on interrupting his classmates in the recitation period, the teacher should:
———Punish him for his misconduct.
———Ignore his remarks, calling on the other pupils.
———Ask him to give the others a chance.
———Try to arrange for him to be in a group with pupils of equal ability.

27. You have been away for a day and the substitute teacher who taught your sixth grade complains to you about the general disorder of your pupils who as a rule give you little disciplinary trouble. It would be best for you to:
———Explain to her methods which she might have used to keep order.
———Express your regret but let the matter rest.
———Admonish your students for their misbehavior.
———Find out from her all the details of the disorder.

28. A girl who likes dancing begins teaching in a community which is bitterly opposed to dancing. She should:
———Give up dancing while in that community.
———Try to convince the people that there is no harm in dancing.
———Give up her position.
———Go to dances anyway occasionally.

29. Suppose one of your pupils feels very much hurt and complains of her marks because she has received lower ones than her friend. She explains that she has always received about the same marks as her friend. If you feel that she is not capable of as good work as her friend it would be best to:
———Tell her that she may get better marks if she studies hard.
———Explain to her that she has not the high ability of her friend.
———Try to arrange for her to get more help on her lessons at home.
———Tell her to study with her friend.

30. A pupil asks a teacher a question that she cannot answer. She should:
———Frankly admit that she does not know.
———Promise to answer the question at another time.
———Ask the pupil to look up the question and report it to the class.
———Try to answer it as best she can.

TEST 2—REASONING AND INFORMATION CONCERNING SCHOOL PROBLEMS

Directions: If the statement is true, make a circle around the T; if it is false, make a circle around the F.

T F 1. All children are born equal in mental ability.

T F 2. Small children dislike to tell their home experiences.

T F 3. All children should be taught alike since they are essentially alike.

T F 4. Teachers should take an active part in the activities of the Parent-Teacher's Association.

T F 5. Encouragement of health habits in the school should be left to the school nurse.

T F 6. Children can usually be taught to like things which they originally dislike.

T F 7. A person may have had a considerable amount of schooling, and yet have a low mentality.

T F 8. A teacher should not administer punishment without being certain that she sees the pupil's point of view on the thing in question.

T F 9. It is equally easy to teach all six year old children.

T F 10. It is natural for children to be active.

T F 11. Girls who make the highest grades in high school will always make better teachers than those who make only average grades.

T F 12. Children do many things merely to get attention.

T F 13. The teacher must consider the individual's peculiarities while trying to correct him.

T F 14. The acquiring of habits in the class room is as important as the acquiring of facts.

T F 15. A teacher should always enquire into the absence of a pupil.

T F 16. "Here We Go 'Round the Mulberry Bush" is a game for children about six years of age.

T F 17. A teacher should hold herself aloof from the religious and social life of the community.

T F 18. A teacher should be able to settle most of her disciplinary problems without reference to the principal.

T F 19. A trained teacher may profit from observation of other teachers' classes.

T F 20. A class tends to reflect the attitudes of the teacher.

T F 21. A mother's estimate of her child is the most reliable one.

T F 22. It is unwise for a young lady teaching in a small town elementary school to have "dates" with high school boys.

T F 23. Teachers often fail because they do not give due consideration to the type of school work they are best fitted to do.

T F 24. Little children like to have familiar stories retold.

T F 25. In a teachers' meeting a teacher should always agree with the opinions of her principal.

T F 26. Good deportment is a reliable indication of high intelligence.

T F 27. A child of ten years should be made to go to school even if he dislikes it.

T F 28. Most children in the first grade like fairy stories.

T F 29. No teacher has the right to expect in a pupil virtues which that teacher fails to practice with reasonable consistency.

T F 30. "Robinson Crusoe" is a story dealing with child life.

T F 31. After a teacher has taught eight or ten years she should retire from teaching.

T F 32. Every girl who finds real pleasure in books should be advised to go to normal school.

T F 33. Supervised play on the playground is bad because it kills the initiative of the child.

T F 34. A teacher should encourage competition in the class room.

T F 35. A busy teacher should limit all her reading to books and magazines on teaching.

T F 36. A teacher should be willing to shoulder all the responsibility for her own acts.

T F 37. The chief value of normal school training is that it gives one a higher social standing.

T F 38. Mischievous pupils are usually vicious pupils.

T F 39. If a child is capable of doing excellent work the teacher should insist on excellent results.

T F 40. If chums are allowed to sit together in the school room it will aid in keeping discipline.

T F 41. Some parents send small children to school to get them out of the way.

T F 42. Any girl who has had a well planned course of professional training will make a successful teacher.

TEST 2—REASONING AND INFORMATION CONCERNING SCHOOL PROBLEMS —Continued

T F 43. Small children like stories which contain a great deal of repetition.

T F 44. "Hiawatha" is a poem elementary school children enjoy.

T F 45. The bright children should usually be encouraged by being exempt from class participation.

T F 46. A normal school training supplies all the requirements needed by a successful teacher.

T F 47. Inattention is usually a sign of ill health.

T F 48. A student should never be allowed to correct a mistake of the teacher.

T F 49. The teacher should make her pupils realise that they are her inferiors because they are young and inexperienced.

T F 50. Ridiculing of pupils in the presence of others is generally an ill-advised form of punishment.

T F 51. Poor environmental conditions have little effect on the school standing of the normal child.

T F 52. It is a waste of time to encourage pupils to study those things in which they are interested because they will learn about them of their own accord.

T F 53. The best way to maintain the attention of a class is to ask the pupils to pay attention.

T F 54. Married women often make the best teachers.

T F 55. A large number of excellent marks made by the pupils is always an indication of good teaching.

T F 56. A reduction of school expenditures is always good economy.

T F 57. Many children fail because they have not had the right teacher.

T F 58. The teaching profession has requirements of dress peculiarly its own.

T F 59. Children should be encouraged to check each other up on mistakes in facts.

T F 60. It is a poor policy for the teacher to play with her pupils because it will lower their respect for her authority.

T F 61. An effective way to handle an unruly pupil is to deny him some privilege enjoyed by all pupils.

T F 62. "Red Riding Hood" is a story that will appeal most to children about twelve years of age.

T F 63. If a girl faints during the progress of a lesson the teacher should go for help.

T F 64. When a child is impudent to the teacher, the teacher should request that his mother punish him.

T F 65. Personality is as important in successful teaching as is training.

T F 66. The child who makes the best marks is usually the most popular.

T F 67. To quiet a class which has become noisy, a teacher should make herself heard above the noise.

T F 68. As a rule the teacher should decline invitations to the students' homes.

T F 69. A teacher should command attention by always standing in the front of the room.

T F 70. Teachers should spend most of their time teaching the slower pupils because the brighter ones can get along by themselves.

T F 71. As a rule it is unwise for teachers to accept Christmas gifts from pupils.

T F 72. Schools having a large number of students offer better opportunities for classification than smaller schools.

T F 73. The best way for a young teacher to have good discipline is to set forth all her rules and regulations the first day and tell the pupils they must obey them or be punished.

T F 74. A teacher should denounce socialism if most people in her community look upon it with doubt.

T F 75. A teacher of history should always justify the policies and actions of the United States.

T F 76. The period of life at which the collecting tendency is strongest is from 15 to 18 years of age.

T F 77. From a professional standpoint a teacher should hesitate to seek appointment to a position held by another person.

T F 78. The classroom of a superior teacher is always quiet and orderly.

T F 79. Children under 12 years of age learn easily to speak a foreign language.

T F 80. It is a good policy for the teacher to visit the home of each pupil at least once a month.

TEST 3—COMPREHENSION AND RETENTION

Directions: Answer the following 20 questions in accordance with the passage on "Speech Defects" which you read at the beginning of the examination. If the statement is true according to this passage, make a circle around the T; if it is false, make a circle around the F.

T F 1. Psychoanalysis is used in treating speech defects due to emotional disturbances.

T F 2. Some individuals are able to recognize objects but are unable to name them.

T F 3. All paralyses of the vocal apparatus are caused by brain injuries.

T F 4. Psychoanalysis is pointed out as being most effective in curing organic speech defects.

T F 5. Injuries to the seventh nerve cause paralysis of certain of the muscles used in speech.

T F 6. Aphasia is the result of brain injury.

T F 7. Speech defects due to paralysis can be traced to organic defects.

T F 8. With the timid individual the "whole method" is more successful than the "part method" in aiding him to overcome his speech defects.

T F 9. Paralysis of the muscles used in speech may be caused by an injury of the brain.

T F 10. A person with physically sound speech organs may have a speech defect.

T F 11. Aphemia is the inability to express oneself in written language.

T F 12. The nasal twang of the New Englander is largely due to sensory aphasia.

T F 13. Agraphia is a kind of motor aphasia.

T F 14. The method of treating functional speech defects by training the individual in the production of sounds which are like those he hears is called the "part method."

T F 15. The person suffering from agraphia is unable to understand what others say to him.

T F 16. Speech defects which are due to emotional shock are classed as functional.

T F 17. Sensory aphasia is best treated by psychoanalysis.

T F 18. Paralytic aphasias are functional.

T F 19. In sensory aphasia the individual is unable to understand the spoken language of another.

T F 20. The anatomical or physical causes of functional speech defects are easily demonstrated.

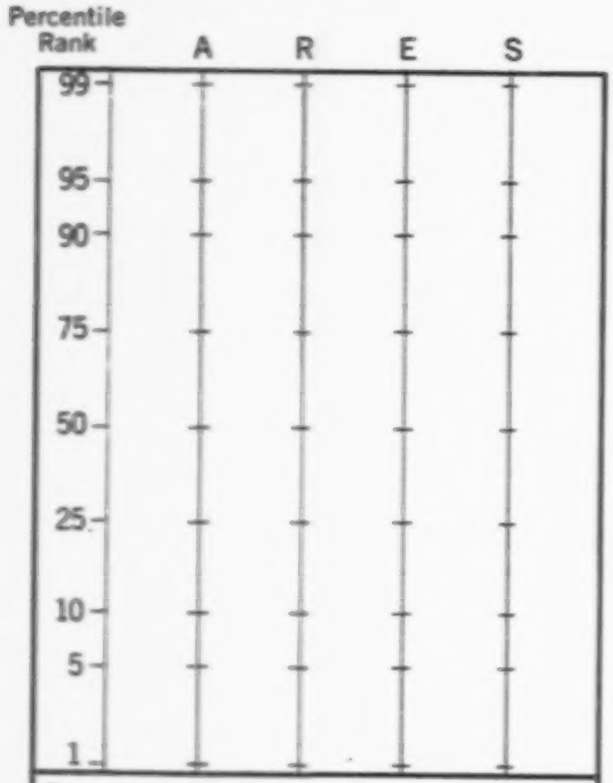
Gordon Personal Profile

EXHIBIT B

19

By Leonard V. Gordon

Name ______ Age ______ Sex ______
Date ______ Marital Status ______
School *or* Firm ______
Grade *or* Occupation ______
City ______ State ______



Score →

Percentile Rank →

Norms used ______

Directions:

In this booklet are a number of descriptions of personal characteristics of people. These descriptions are grouped in sets of four. You are to examine each set and find the one description that is *most like you.* Then make a solid black mark between the pair of dotted lines following that statement, in the column headed M (*Most*).

Next examine the other three statements in the set and find the one description that is *least like you;* then make a solid black mark between the pair of dotted lines following that statement, in the column headed L (*Least*). Do *not* make any marks following the two remaining statements.

Here is a sample set:

		M	L
	has an excellent appetite...........................		
	gets sick very often..................................		▮
	follows a well-balanced diet.........................		
	doesn't get enough exercise.........................	▮	

Suppose that you have read the four descriptive statements in the sample and have decided that, although several of the statements may apply to you to some degree, "doesn't get enough exercise" is *more like you* than any of the others. You would fill in the space following that statement in the column headed M (*Most*), as shown in the sample.

You would then examine the other three statements to decide which one is *least like you.* Suppose that "gets sick very often" is *less like you* than the other two. You would fill in the space following that statement in the column headed L (*Least*), as shown in the sample above.

For every set you should have *one* and *only one* mark in the M (*Most*) column, and *one* and *only one* mark in the L (*Least*) column. There should be *no* marks following two of the statements.

In some cases it may be difficult to decide which statements you should mark. Make the best decisions you can. Remember, this is not a test; there are no right or wrong answers. You are to mark certain statements in the way in which they most nearly *apply to you.* Be sure to mark *one* statement as being *most like you* and *one* as being *least like you,* leaving two statements unmarked. Do this for every set. Turn the booklet over and begin.

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a

Start with this page. Mark your answers in column **A** →

a good mixer socially........................
lacking in self-confidence....................
thorough in any work undertaken..............
tends to be somewhat emotional...............

not interested in being with other people........
free from anxieties or tensions.................
quite an unreliable person....................
takes the lead in group discussion..............

acts somewhat jumpy and nervous.............
a strong influence on others....................
does not like social gatherings.................
a very persistent and steady worker............

finds it easy to make new acquaintances........
cannot stick to the same task for long...........
easily managed by other people................
maintains self-control even when frustrated......

able to make important decisions without help..
does not mix easily with new people............
inclined to be tense or high-strung.............
sees a job through despite difficulties...........

not too interested in mixing socially with people..
doesn't take responsibilities seriously..........
steady and composed at all times..............
takes the lead in group activities ....

a person who can be relied upon...............
easily upset when things go wrong.............
not too sure of own opinions..................
prefers to be around other people..............

finds it easy to influence other people...........
gets the job done in the face of any obstacle.....
limits social relations to a select few............
tends to be a rather nervous person............

doesn't make friends very readily..............
takes an active part in group affairs............
keeps at routine duties until completed..........
not too well-balanced emotionally..............

Turn the page and go on.

***Mark your answers in column* B →**

	B		A	
	M	**L**	**M**	**L**
assured in relationships with others				
feelings are rather easily hurt				
follows well-developed work habits				
would rather keep to a small group of friends				
	M	**L**	**M**	**L**
becomes irritated somewhat readily				
capable of handling any situation				
does not like to converse with strangers				
thorough in any work performed				
	M	**L**	**M**	**L**
prefers not to argue with other people				
unable to keep to a fixed schedule				
a calm and unexcitable person				
inclined to be highly sociable				
	M	**L**	**M**	**L**
free from worry or care				
lacks a sense of responsibility				
not interested in mixing with the opposite sex				
skillful in handling other people				
	M	**L**	**M**	**L**
finds it easy to be friendly with others				
prefers to let others take the lead in group activity				
seems to have a worrying nature				
sticks to a job despite any difficulty				
	M	**L**	**M**	**L**
able to sway other people's opinions				
lacks interest in joining group activities				
quite a nervous person				
very persistent in any task undertaken				
	M	**L**	**M**	**L**
calm and easygoing in manner				
cannot stick to the task at hand				
enjoys having lots of people around				
not too confident of own abilities				
	M	**L**	**M**	**L**
can be relied upon entirely				
doesn't care for the company of most people				
finds it rather difficult to relax				
takes an active part in group discussion				
	M	**L**	**M**	**L**
doesn't give up easily on a problem				
inclined to be somewhat nervous in manner				
lacking in self-assurance				
prefers to pass the time in the company of others				

A	R	E	S

EXHIBIT C

ORIGINAL PRE-TEACHING ANXIETY SCHEDULE

Place a check in the column which is most descriptive of your feelings about each of the following items as you prepare for your student teaching this fall.

		Very Anxious	Somewhat Anxious	No Anxiety
1.	Having good classroom order			
2.	Getting along with my supervising teacher			
3.	Being liked and accepted by the children			
4.	Being able to make them understand me			
5.	Holding their interest and attention			
6.	Having sufficient knowledge of subject matter			
7.	Knowing right teaching technique for each subject			
8.	Looking too young to be a teacher			
9.	Fear of standing before a group			
10.	Not being able to keep within time limits			
11.	Not being able to answer children's questions			
12.	Not being able to meet the needs of all the children			
13.	Fixing bulletin boards			
14.	Keeping records			
15.	Meeting the principal and other faculty members			
16.	Teaching for the College supervisor			
17.	Racial prejudice			

EXHIBIT D

REVISED PRE-TEACHING ANXIETY SCHEDULE

STUDENT CODE NO.____

Place a check in the column which is most descriptive of your feelings about each of the following items as you prepare for your student teaching this fall.

	VERY WORRIED	SOMEWHAT WORRIED	A LITTLE ANXIOUS	NO ANXIETY
1. Having good classroom order				
2. Getting along with my sponsoring teacher				
3. Teaching for my college supervisor				
4. Being liked and accepted by the children				
5. Being able to make the children understand me				
6. Holding their interest and attention				
7. Having sufficient knowledge of the subject matter				
8. Knowing the right teaching technique for each subject				
9. Fear of standing before a group				
10. Not being able to keep within time limits				
11. Not being able to answer children's questions				
12. Looking too young to be a teacher				
13. Not being able to meet the needs of all the children				
14. Fixing bulletin boards				
15. Keeping records				
16. Meeting the principal and other faculty members				

EXHIBIT E

COURSE OUTLINE: FIRST QUARTER

COURSE OUTLINE

The Language Arts

- I. The Language Arts
  - A. Programs: Discrete; Core Types
  - B. Value of Each
- II. Spelling as a Tool of Communication
  - A. Factors involved in learning to spell
  - B. Basic principles of spelling and ways of teaching
- III. Handwriting as a Tool of Communication
  - A. Readiness factors and common problems
  - B. Manuscript vs. cursive
  - C. The handwriting lesson: formal vs. informal
- IV. Reading as Communication
  - A. The nature of the reading act
  - B. Modern theories of reading and child development
  - C. Teaching reading
    - 1. Developmental approach (Group) - (Basic Reader)
      - a. Reading Readiness
        - Readiness factors
        - Determining readiness
        - Setting up a program
      - b. Reading in the primary grades
        - The experience chart technique
        - Development of initial meanings and sight vocabulary
        - The word-attack skills
        - Comprehension skills
        - Oral reading and free reading
      - c. Grouping for individual differences
      - d. Planning the primary reading lesson:
        - Parts; procedures; assignments
      - e. Reading in the middle and upper grades
        - Changes in child-interests and purposes
        - New demands and new needs
        - Planning for these changes
    - 2. Individualized Approaches to Reading
      - a. Self-selection and self-pacing
      - b. The teacher conference
      - c. Grouping for skills
      - d. Other types of individualization: Reading Laboratories and Programed Instruction
    - 3. Remedial Reading
      - a. Causes of failure
      - b. Prevention of failure
      - c. Some approaches to remediation

EXHIBIT F

COURSE OUTLINE: SECOND QUARTER

V. Listening as a Form of Communication
  A. Values of teaching listening
  B. Developing the power to listen

VI. Expression as a Form of Communication (English)
  A. Forms and values of oral communication
  B. Teaching creative and functional oral expression
  C. Linguistic and functional approaches to written expression
  D. Creative and useful written expression
  E. Grammar as a tool of expression

VII. Story-Telling, Drama, and Poetry as Special Forms of Communication

Understanding and Teaching Arithmetic

I. Introduction to Arithmetic as Mathematics
  A. Number and its properties
    1. Number systems and numeration
    2. Number bases
  B. Sentences and Set
    1. Concept and terminology
    2. Operations defined on set
  C. The number line

II. Teaching Arithmetic
  A. Building basic concepts in Arithmetic: symbols, numberness, place value
  B. Teaching the basic operations with integers: for each:
    1. The concepts, the vocabulary, and symbolism
    2. Principles, facts and processes
    3. Special forms of subtraction and division situations
  C. Teaching the basic operations with fractions
    1. Concepts, vocabulary, and symbolism
    2. Reduction to higher and lower terms
    3. Principles, facts, and processess
  D. Teaching decimal fractions and per cent
    1. Concepts, vocabulary, and symbolism
    2. Reduction: decimals, and percentage
    3. Computations with both forms
  E. Denominate numbers and measurement
    1. Concepts and reductions
    2. Computation and application
  F. The Verbal Problem
    1. Value: source and objective of computation
    2. Special problems in teaching
  G. Geometry in the Elementary School

III. Evaluation in Arithmetic
   A. Evaluating total programs
   B. Evaluating Children's learnings: Tests, observation, applications, creative uses.

IV. Enrichment and Depth Learnings in Arithmetic
   A. Identifying both superior and slower learners
   B. Providing for their needs at their respective levels

V. Special Issues in Arithmetic Instruction
   A. Content
   B. Special programs
   C. Programed Instruction
   D. Grouping
   E. Specialized teachers vs. Homeroom teachers

VI. Current Research and Experimental Programs

VII. Basic Lesson Plan for Teaching Arithmetic
   A. Readiness: Social situation, problem, and need for discovery
   B. Directed discovery experience and attainment of generalization
   C. The use of the text for amplification, and individualized practice.

(Proper materials and the need for an approach through pupil-discovery will be stressed throughout.)

EXHIBIT G

LANGUAGE ARTS TEST I

Make every sentence which you judge false into a true statement of a principle by changing any part EXCEPT the underlined part. You may justify your choice of added words or substituted words in the right hand column. If you judge a sentence true, merely mark it TRUE.

1. Since there are certain skills in spelling which ought to be mastered by every normal child, the discrete approach to spelling and the language arts ought to be used.
2. Skill in learning how to spell depends very much on a child's ability to grasp word form and to be able to synchronize sight and sound.
3. Since our language is not a true regularized language, it is more or less a waste of time to have children generalize as to spelling rules.
4. Left to right visual progression is an ability fundamental mainly to reading only.
5. Reading is a series of complex mental processes involving perception, comprehension, and critical reaction.
6. Since word perception is the basis of the reading act, it should be the chief objective of the reading program.
7. The richness and variety of meaning which the printed symbols in reading convey to the reader depends almost entirely on the skill of the author.
8. The degree to which a child will succeed in learning to read is conditioned by the degree to which he is "ready to read."

9. However, children who are mature in every other way, but are somewhat retarded socially and emotionally, may begin reading instruction with special guidance from the teacher.

10. The adequacy of a child's experiential background depends on the quality and quantity of his vicarious experiences.

11. Asking a child to spell a reading word will aid him to be a better reader since it forces him to give attention to the letters in progression.

12. A meaningful approach to the language arts means starting each lesson with a situation which arises spontaneously in the classroom.

13. Grouping children according to a combination of general intellectual ability and a reading readiness test will produce groups which are actually homogeneous.

14. Since learning by imitation is merely a form of rote learning, the teacher of younger children would do well to discourage such learning procedures.

15. A thought-provoking, discovery-type of question is generally an economical way of generating a need or motive for learning in the child.

EXHIBIT H

LANGUAGE ARTS TEST II

Make every sentence which you judge false into a true statement of a principle by changing any part EXCEPT the underlined part. You may justify your choice of added words or substituted words in the right hand column. If you judge a sentence true, merely mark it TRUE.

1. Phonetic analysis should be so well taught that it can be used independently of other word clues.
2. It is possible to recognize form and pronounciation of a word and fail to be able to read it.
3. Structural analysis provides practice in finding little words in big words.
4. Each word attack skill should be taught thoroughly and separately before the child is introduced to a new one.
5. Speed of reading has no value except as speed of comprehension.
6. Superior readers need a considerable amount of your time so that they will not become bored or acquire habits of mental laziness.
7. There is wider variation and complexity in teaching reading as one goes up the grades.
8. The most prevalent causes of failure in reading are physical causes such as defective sight, hearing, and other physical handicaps.

Complete the following statements using a professional or technical term.

1. Silent reading done under the direction of the teacher for a purpose may be called______________________ reading.
2. Basic reading from a basal text should be done at the child's ____________ ____________reading level.
3. ______________ __________ technique is a good bridge from reading readiness to reading.
4. __________________ clues are the best clues to meaning.
5. Solving problems vicariously through reading is called _________________.
6. A ____________ approach in remedial reading is advocated for asphasic children or for those who not as visually or aurally oriented as are most children.
7. Our philosophy of word attack may be expressed as the_______________ theory.
8. The three classification of causes for reading failure are______________, ______________, ______________.

On the back of this paper supply two or three important names in the field of reading: identify their specialty whenever possible.

EXHIBIT I

ARITHMETIC TEST III[*]

Write "T" on the answer line for each sentence that expresses a true idea. Write "F" for each sentence that expresses a false idea.

1 $14 > 17 - 3$.

2 $\{7, 5, 9\}$ is a subset of the set of odd numbers that are less than 10.

3 If the universe is the set of odd numbers between 10 and 20, then the solution set of $x > 18$ is the entire universe.

4 If the universe is the set of natural numbers, then $\{1, 2, 3, 4, 5\}$ is a subset of $\{x \mid x > 6\}$.

5 Each member of the solution set of the sentence $3 + x < 9$ must be a member of the universe for x.

6 $2(5) < 25$

7 The set of even numbers is a subset of the set of odd numbers.

8 If the universe is the set of natural numbers, then $\{10, 11, 12\}$ is a subset of $\{x \mid x > 10\}$.

9 On the natural number line, the distance between Point 1 and Point 2 is the same as the distance between Point 2 and Point 3.

10 If the universe for x is the set of natural numbers, then the solution set of $x < 1$ has no members.

Each set described in Exercises 11-17 is tabulated in the column at the right labeled **a** through **h**. For each set find the correct tabulation and write its letter on the answer line. You may use a tabulation more than once. Some tabulations may not be used at all.

11 The set of even numbers between 5 and 17

12 $\{x \mid x + 3 < 9\}$ $U = N$.

13 The set of odd numbers less than 10,000

14 The set of natural numbers

15 $\{x \mid x + 5 < 2\}$ $U = N$.

16 $\{x \mid x + 3 > x\}$ $U = N$.

17 The set of natural numbers less than 6

a $\{1, 2, 3, \cdots, 9999\}$

b $\{\ \}$

c $\{6, 8, 10, 12, 14, 16\}$

d $\{1, 3, 5, \cdots, 9999\}$

e $\{1, 2, 3, \cdots\}$

f $\{5, 6, 7, \cdots, 17\}$

g $\{1, 2, 3, 4, 5\}$.

h $\{1, 2, 3, \cdots, 10\}$

---

[*] **Used by permission of Scott, Foresman and Company from *Scott, Foresman Experimental Mathematics Project*.**

In Exercises 18-25, select the phrase that best completes each sentence. Write the label of the phrase on the answer line for the exercise.

18 A name for a number is called a

a placeholder **c** numeral

b equation **d** sentence

19 Objects that belong to a given set are called

a numbers in the set **c** subsets of the set

b members of the set **d** the universe

20 A set that has no members is called the

a universe **c** empty set

b natural numbers **d** solution set

21 The sentence $x + 5 = 9$ expresses a

a true statement **c** false statement

b condition **d** solution set

22 The sentence $9 - 5 < 20$ expresses a

a true statement **c** false statement

b condition **d** number

23 When you graph a set of numbers, you match the numbers with

a sentences **c** members of another set of numbers

b points on a line **d** placeholders

24 The set of natural numbers is a

a set having 20 members **c** infinite set

b empty set **d** set having 1 member

25 The set whose members are used to make replacements for a placeholder in a sentence is called the

a empty set **c** universe for the placeholder

b infinite set **d** solution set of the sentence

EXHIBIT J

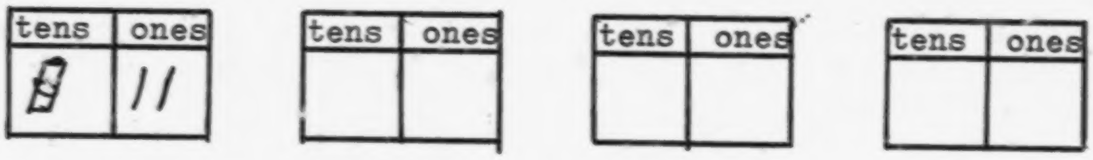
ARITHMETIC TEST IV

1. Cardinal number means: 1. any number that can be counted; 2. the number of units in a group.

2. The first "rational-counting" meaning to be developed should be: 1. one-to-one correspondence; 2. identification of number in a group without needing to count.

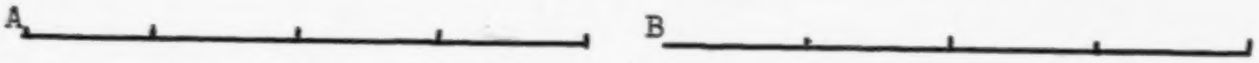
3. The most difficult numbers for children to grasp are: 1. the "teen" numbers; 2. numbers of more than three numerals.

4. Illustrate the progressive solution of this problem on the following charts: $12 - 7 = \square$



5. On numberline A illustrate $5 + 3 = \square$

   on numberline B illustrate $8 - 5 = \square$ or $8 - 3 = \square$



6. Fill in the following outline so that it explains the principle:

   Achievement levels will often begin at the concrete level but should eventually lead to the abstract:

   Levels
   1. ____________________ and ____________________
   2. ____________________
   3. ____________________ or ____________________ (Only one answer needed here.)
   4. ____________________
   5. ____________________

EXHIBIT K

ARITHMETIC TEST V

Questions based direcly on assigned portion of the test:

To be able to solve verbal problems, the children must have a number of special ____________________ skills.

Two helps toward determining the process to be used in solving a verbal problem might be ____ ____

Verbal problems in a book or any made up by the teacher, should have some relation to ____

There are two different meanings for division, the __________ idea and the ___________ idea. Since the ___________ is easier to understand, it should be introduced first.

Decimal fractions should not be hard for children since they are an extension of the idea of ______________ that the children already know.

Throughout the intermediate grades, measurement should be approached through the use of ______ __________ ____________ and should have for a principal objective the ability to _______________.

(Applications)

On the back of this paper, draw simple pictures to illustrate for children:

1. 3 x 5   2. The composition of 27.   3. 2¼ + 1½ =

Illustrate, on the reverse of this paper, using a numberline situation:

4. 16 ÷ 3 = 5 R.1   5. 2½ - 1¼

6. Show by a semi-concrete illustration and accompanying explanation why multiplying by a fraction yields a number less than you started with.

7. Make up a verbal problem in subtraction for a third grade, incorporating the remainder concept and being most readily relevant to the decomposition form of subtraction algorism.

8. Complete this problem by the "educated guess" method based on place value.

$$3\overline{)32726}$$

EXHIBIT L

STUDENT TEACHER RATING SCALE[1]

Name of Student________________________ Date ________________

Supervising Teacher______________________ School ________________

DIRECTION: Please rate your student teacher in each of the following characteristics by encircling the proper number according to her professional behavior. On this scale, # 4 indicates that the student is exceptional in the trait involved, whereas # 1 indicates ineffective behavior. In order to help you, a descriptive phrase is attached to the upper and lower ends of the scale.

I. Alert, appears enthusiastic.	4	3	I. Is apathetic, dull, appears bored.	2	1
II. Appears interested in pupils and classroom activities.	4	3	II. Appears uninterested in pupils and classroom activities.	2	1
III. Cheerful, optimistic.	4	3	III. Is depressed, pessimistic; appears unhappy.	2	1
IV. Self-controlled, not easily upset.	4	3	IV. Looses temper, is easily upset.	2	1
V. Likes fun, has a sense of humor.	4	3	V. Is overly serious, too occupied for humor	2	1
VI. Recognizes and admits own mistakes.	4	3	VI. Is unaware of, or fails to admit, own mistakes.	2	1
VII. Is fair, impartial, and objective in treatment of pupils.	4	3	VII. Is unfair or partial in dealing with pupils.	2	1
VIII. Is patient.	4	3	VIII. Is impatient.	2	1
IX. Shows understanding and sympathy in working with pupils.	4	3	IX. Is short with pupils, uses sarcastic remarks, or in other ways shows lack of sympathy with pupils.	2	1
X. Is friendly and courteous in relations with pupils.	4	3	X. Is aloof and removed in relations with pupils.	2	1
XI. Helps pupils with personal as well as educational problems.	4	3	XI. Seems unaware of pupils' personal needs and problems.	2	1

---

[1] Adapted from: David G. Ryans, "Generalized Descriptions of Critical Behaviors of Teachers," Characteristics of Teachers, p. 82. with the permission of the American Council on Education.

XII.	Commends effort and gives praise for work well done.	4	3	XII.	Does not commend pupils, is disapproving, hypercritical.	2	1
XIII.	Accepts pupils' efforts as sincere.	4	3	XIII.	Is suspicious of pupil motives.	2	1
XIV.	Anticipates reactions of others in social situations.	4	3	XIV.	Does not anticipate reactions of others in social situations.	2	1
XV.	Encourages pupils to try to do their best.	4	3	XV.	Makes no effort to encourage pupils to try to do their best.	2	1
XVI.	Classroom procedure is flexible within over-all plan.	4	3	XVI.	Shows extreme rigidity of procedure, inability to depart from plan.	2	1
XVII.	Classroom procedure is planned and well organized.	4	3	XVII.	Procedure is without plan, disorganized.	2	1
XVIII.	Anticipates individual needs.	4	3	XVIII.	Fails to provide for individual differences and needs of pupils.	2	1
XIV.	Stimulates pupils through interesting and original materials and techniques.	4	3	XIV.	Uninteresting materials and teaching techniques used.	2	1
XX.	Conducts clear, practical demonstrations and explanations.	4	3	XX.	Demonstrations and explanations are not clear and are poorly conducted.	2	1
XXI.	Is clear and thorough in giving directions.	4	3	XXI.	Directions are incomplete, vague.	2	1
XXII.	Encourages pupils to work through their own problems and evaluate their accomplishments.	4	3	XXII.	Fails to give pupils opportunity to work out own problems or evaluate their own work.	2	1
XXIII.	Disciplines in quiet, dignified, and positive manner.	4	3	XXIII.	Reprimands at length, ridicules, resorts to cruel or meaningless forms of correction.	2	1
XXIV.	Gives help willingly.	4	3	XXIV.	Fails to give help or gives it grudgingly.	2	1
XXV.	Foresees and attempts to resolve potential difficulties.	4	3	XXV.	Is unable to foresee and resolve potential difficulties.	2	1

MARYGROVE COLLEGE DETROIT 21, MICHIGAN DEPARTMENT OF EDUCATION

EXHIBIT M

Dear Sponsoring Teacher,

You have already received the regular Semester Report of Directed Teaching which you are currently filling out for your student teacher. The enclosed form is an entirely different kind of instrument. We are collecting data for a piece of research which is being sponsored by the Cooperative Research Branch of the U. S. Department of Health, Education, and Welfare. Would you please mark this rating scale and return it, sealed, in the accompanying self-addressed envelope. The ratings on this scale will not be used to formulate either the midsemester or the final mark of your student teacher. Will you please be as objective as possible, trying not to compare the ratings on this scale with the grades which you have already given your student.

Sincerely,

APPENDIX III

COMPUTATIONAL DATA

EXHIBIT A

COMPUTATIONAL DATA FOR *t* TEST OF SIGNIFICANCE WITH RESPECT TO PERSONALITY CHANGES

Sociability and Emotional Stability

$$s^2 = \sum D^2/n - \overline{D}^2 = 2673.5/20 - (-7.37)^2 = 79.355$$

$$s = \sqrt{79.355} = 8.9$$

$$s_{\overline{D}} = s/\sqrt{n-1} = 8.9/4.35 = 2.046$$

$$t_{obs} = \overline{D}/s_{\overline{D}} = -7.35/2.046 = (-)3.59 \qquad t_{.01}(19df) = 2.896$$

Emotional Stability

$$s^2 = \sum D^2/n - \overline{D}^2 = 296.9 - 20.25 = 276.6$$

$$s = \sqrt{276.65} = 16.6$$

$$s_{\overline{D}} = s/\sqrt{n-1} = 16.6/4.35 = 3.8$$

$$t_{obs} = \overline{D}/s_{\overline{D}} = -4.5/3.8 = (-)1.18 \qquad t_{.05}(19df) = 2.093$$

Sociability

$$s^2 = \sum D^2/n - \overline{D}^2 = 5416/20 - 104.04 = 166.76$$

$$s = \sqrt{166.76} = 12.9$$

$$s_{\overline{D}} = s/\sqrt{n-1} = 12.9/4.35 = 2.959$$

$$t_{obs} = \overline{D}/s_{\overline{D}} = -10.2/2.959 = (-)3.447 \qquad t_{.01}(19df) = 2.861$$

EXHIBIT B

COMPUTATIONAL DATA FOR ANALYSIS OF COVARIANCE FOR THE PRE-TEACHING ANXIETY SCHEDULE

$n_1 = 20$ $n_2 = 20$ $N = 40$

$T_{X_1} = 899$ $T_{X_2} = 979$ $\sum X_1^2 = 41587$ $\sum X_2^2 = 48891$

$T_{Y_1} = 1045$ $T_{Y_2} = 952$ $\sum Y_1^2 = 54877$ $\sum Y_2^2 = 45828$

$\sum XY_1 = 47194$ $\sum XY_2 = 46710$

$\overline{X}_1 = 44.95$ $\overline{X}_2 = 48.95$ $\overline{X} = 46.95$ $\overline{Y}_1 = 52.25$ $\overline{Y}_2 = 47.6$

$$S_{xx} = \sum(X)^2 - (T_{X_1} + T_{X_2})^2/N = 90478 - 88172.1 = 2305.9$$

$$S_{yy} = \sum(Y)^2 - (T_{Y_1} + T_{Y_2})^2/N = 100705 - 99700.225 = 1004.775$$

$$S_{xy} = \sum XY - (T_{X_1} + T_{X_2})(T_{Y_1} + T_{Y_2})/N = 93904 - 93759.15 = 144.85$$

$$E_{xx} = \sum(X)^2 - (T_{X_1}^2/n_1 + T_{X_2}^2/n_2) = 90478 - 88332.1 = 2145.9$$

$$E_{yy} = \sum(Y)^2 - (T_{Y_1}^2/n_1 + T_{Y_2}^2/n_2) = 100705 - 99916.45 = 788.55$$

$$E_{xy} = \sum XY - (T_{X_1}T_{Y_1}/n_1 + T_{X_2}T_{Y_2}/n_2) = 93904 - 93573.15 = 330.85$$

Analysis of Variance

Source	SS	df	MS	F
Total: S_{yy}	1004.775	kn-1 = 39		
Error: E_{yy}	788.55	kn-2 = 38	$E_{yy}/df = 20.75$	$\frac{MS_T}{MS_E} = 10.4$
Treatments: T_{yy}	216.225	k-1 = 1	$T_{yy}/df = 216.225$	

$S'_{yy} = S_{yy} - S^2_{xy}/S_{xx} = 1004.775 - 9.099 = 995.676$

$E'_{yy} = E_{yy} - E^2_{xy}/E_{xx} = 788.55 - 11.01 = 737.54$

Analysis of Covariance

Source	SS	df	MS	F
Total: S'_{yy}	995.676	kn-2 = 38		
Error: E'_{yy}	737.541	(kn-2)-1=37	$\frac{E'_{yy}}{37} = 19.93$	$MS_{TR}/MS_{E'} =$ 12.95**
Treatments: T_{yy_R}	258.135	k - 1 = 1	$T_{yy_R}/1 = 258.135$	

$^{**}F_{.99}(1,37) = 7.37$

Regression Coefficient: (Pooled within-class)

$b = E_{xy}/E_{xx} = .154$

Adjusted Treatment Means

$\overline{Y'_1} = \overline{Y}_1 - b(\overline{X}_1 - \overline{X}) = 52.25 - .154(44.95 - 46.95) = 52.558$

$\overline{Y'_2} = \overline{Y}_2 - b(\overline{X}_2 - \overline{X}) = 47.6 - .154(48.95 - 46.95) = 47.292$

Test on Assumption of Homogeneity of Treatment and Regression Effects

$S_1 = E_{yy} - (E^2_{xy_1}/E_{xx_1} + E^2_{xy_2}/E_{xx_2}) = 788.55 - 53.9 = 734.65$

$S_2 = (E^2_{xy_1}/E_{xx_1} + E^2_{xy_2}/E_{xx_2}) - E^2_{xy}/E_{xx} = 53.9 - 51.01 = 2.89$

$$F_{obs} = \frac{S_2/(k-1)}{S_1/K(n-2)} = \frac{2.89}{20.406} = .14^{**}$$

**F < 1 is always non-significant

EXHIBIT C

COMPUTATIONAL DATA FOR ANALYSIS OF VARIANCE FOR ACHIEVEMENT IN THE METHODS COURSE

$n_1 = 20$ $n_2 = 20$ $N = 40$

$T_{Y_1} = 1934$ $T_{Y_2} = 1647$ $\sum Y_1^2 = 188374$ $\sum Y_2^2 = 137505$

$\overline{Y}_1 = 96.70$ $\overline{Y}_2 = 82.35$

$$S_{yy} = \sum (Y)^2 - (T_{Y_1} + T_{Y_2})^2/N = 325879 - 320589.02 = 5289.98$$

$$E_{yy} = \sum (Y)^2 - (T^2_{Y_1}/n_1 + T^2_{Y_2}/n_2) = 325879 - 322648.25 = 3230.75$$

Analysis of Variance

Source	SS	df	MS	F
Total: S_{yy}	5289.98	kn-1=39		$\frac{MS_T}{MS_E} = 24.22^{**}$
Error: E_{yy}	3230.75	kn-2=38	$E_{yy}/38 = 85.01$	
Treatments: T_{yy}	2059.23	k-1=1	$T_{yy}/1 = 2059.23$	

$^{**}F_{.9999}(1,38) = 18.953$

Test for Homogeneity of Variance

$SS_1 = \sum Y_1^2 - T_1^2/n_1 = 188374 - 18701.8 = 1356.2$ $s_1^2 = SS_1/n_1 - 1 = 71.37$

$SS_2 = \sum Y_2^2 - T_2^2/n_2 = 137505 - 135630.45 = 1874.55$ $s_2^2 = SS_2/n_2 - 1 = 99.66$

$$F_{max} = \frac{s^2_{largest}}{s^2_{smallest}} = \frac{99.66}{71.37} = 1.39^{**}$$

$^{**}F_{max}(k, n-1) = F_{max_{.95}}(2, 19) = 2.54$

EXHIBIT D

COMPUTATIONAL DATA FOR ANALYSIS OF COVARIANCE FOR THE STUDENT TEACHER RATING SCALE: FIRST QUARTER

$n_1 = 19$ $\quad n_2 = 19$ $\quad N = 38$

$T_{X_1} = 846$ $\quad T_{X_2} = 927$ $\quad \sum X_1^2 = 38778$ $\quad \sum X_2^2 = 46187$

$T_{Y_1} = 1629$ $\quad T_{Y_2} = 1508$ $\quad \sum Y_1^2 = 140943$ $\quad \sum Y_2^2 = 122736$

$\sum XY_1 = 72605$ $\quad \sum XY_2 = 73633$

$\overline{X}_1 = 44.52$ $\quad \overline{X}_2 = 48.78$ $\quad \overline{Y} = 46.65$ $\quad \overline{Y}_1 = 85.73$ $\quad \overline{Y}_2 = 79.36$

$$S_{xx} = \sum(X)^2 - (T_{X_1} + T_{X_2})^2/N = 84965 - 82724.447 = 2240.553$$

$$S_{yy} = \sum(Y)^2 - (T_{Y_1} + T_{Y_2})^2/N = 263679 - 258967.605 = 4711.395$$

$$S_{xy} = \sum XY - (T_{X_1} + T_{X_2})(T_{Y_1} + T_{Y_2})/N = 146238 - 146365.815 = -127.815$$

$$E_{xx} = \sum(X)^2 - (T_{X_1}^2/n_1 + T_{X_2}^2/n_2) = 84965 - 82897.105 = 2067.895$$

$$E_{yy} = \sum(Y)^2 - (T_{Y_1}^2/n_1 + T_{Y_2}^2/n_2) = 263679 - 259352.893 = 4326.107$$

$$E_{xy} = \sum XY - (T_{X_1}T_{Y_1}/n_1 + T_{X_2}T_{Y_2}/n_2) = 146238 - 146107.894 = 130.106$$

Analysis of Variance

Source	SS	df	MS	F
Total: S_{yy}	4711.395	kn-1 = 37		
Error: E_{yy}	4326.107	kn-2 = 36	E_{yy}/df = 120.169	$\frac{MS_T}{MS_E}$ =3.206
Treatments: T_{yy}	385.288	k-1 = 1	T_{yy}/df = 385.288	

$S'_{yy} = S_{yy} - S^2_{xy}/S_{xx} = 4711.395 - 7.291 = 4704.104$

$E'_{yy} = E_{yy} - E^2_{xy}/E_{xx} = 4326.107 - 8.185 = 4317.912$

Analysis of Covariance

Source	SS	df	MS	F**
Total: S'_{yy}	4704.104	kn-2 = 36		
Error: E'_{yy}	4317.912	(kn-2)-1=35	$\frac{E'_{yy}}{37} = 123.368$	$\frac{MS_{TR}}{MS_{E'}} = 3.13$
Treatments: T_{yy_R}	386.192	k - 1 = 1	$T_{yy_R}/1 = 386.192$	

$^{**}F_{.95}(1,35) = 4.12$

Regression Coefficient: (Pooled Within-Class)

$$b = E_{xy}/E_{xx} = .062$$

Adjusted Treatment Means

$\overline{Y}'_1 = \overline{Y}_1 - b\ (\overline{X}_1 - \overline{X}) = 85.73 - .062(44.52 - 46.65) = 85.862$

$\overline{Y}'_2 = \overline{Y}_2 - b\ (\overline{X}_2 - \overline{X}) = 79.36 - .062(48.78 - 46.65) = 79.228$

Test on Assumption of Homogeneity of Treatment and Regression Effects

$S_1 = E_{yy} - (E^2_{xy_1}/E_{xx_1} + E^2_{xy_2}/E_{xx_2}) = 4326.107 - 8.193 = 4317.914$

$S_2 = (E^2_{xy_1}/E_{xx_1} + E^2_{xy_2}/E_{xx_2}) - E^2_{xy}/E_{xx} = 8.193 - 8.185 = .006$

$$F_{obs} = \frac{S_2/(k-1)}{S_1/K(n-2)} = \frac{.006}{126.997} = .000062^{**}$$

** F < 1 is always non-significant

EXHIBIT E

COMPUTATIONAL DATA FOR ANALYSIS OF COVARIANCE FOR THE STUDENT TEACHER RATING SCALE: SECOND QUARTER

$n_1 = 19$ $n_2 = 19$ $N = 38$

$T_{X_1} = 846$ $T_{X_2} = 927$ $\sum X_1^2 = 38778$ $\sum X_2^2 = 46187$

$T_{Y_1} = 1655$ $T_{Y_2} = 1488$ $\sum Y_1^2 = 145383$ $\sum Y_2^2 = 117508$

$\sum XY_1 = 73773$ $\sum XY_2 = 72656$

$\overline{X}_1 = 44.52$ $\overline{X}_2 = 48.78$ $\overline{X} = 46.65$ $\overline{Y}_1 = 87.1$ $\overline{Y}_2 = 78.31$

$$S_{xx} = \sum(X)^2 - (T_{X_1} + T_{X_2})^2/N = 84965 - 82724.447 = 2240.553$$

$$S_{yy} = \sum(Y)^2 - (T_{Y_1} + T_{Y_2})^2/N = 262891 - 259959.184 = 2931.816$$

$$S_{xy} = \sum XY - (T_{X_1} + T_{X_2})(T_{Y_1} + T_{Y_2})/N = 146429 - 146645.763 = -216.763$$

$$E_{xx} = \sum(X)^2 - (T_{X_1}^2/n_1 + T_{X_2}^2/n_2) = 84965 - 82897.105 = 2067.895$$

$$E_{yy} = \sum(Y)^2 - (T_{Y_1}^2/n_1 + T_{Y_2}^2/n_2) = 262891 - 260693.104 = 2197.896$$

$$E_{xy} = \sum XY - (T_{X_1}T_{Y_1}/n_1 + T_{X_2}T_{Y_2}/n_2) = 146429 - 146289.788 = 139.212$$

Analysis of Variance

Source	SS	df	MS	F
Totals: S_{yy}	2931.816	kn-1 = 37		$\frac{MS_T}{MS_E} = 12.021$
Error: E_{yy}	2197.896	kn-2 = 36	$E_{yy}/df = 61.052$	
Treatments: T_{yy}	733.92	k-1 = 1	$T_{yy}/df = 733.92$	

$S'_{yy} = S_{yy} - S^2_{xy}/S_{xx} = 2931.816 - 20.97 = 2910.846$

$E'_{yy} = E_{yy} - E^2_{xy}/E_{xx} = 2197.896 - 9.371 = 2188.525$

Analysis of Covariance

Source	SS	df	MS	F**
Total: S'_{yy}	2910.846	kn - 2= 36		
Error: E'_{yy}	2188.525	(kn-2)-1=35	$\frac{E'_{yy}}{df} = 62.529$	$\frac{MS_{TR}}{MS_{E'}} = 11.551$
Treatments: T_{yy_R}	722.321	k-1 = 1	$T_{yy_R}/df = 722.321$	

$^{**}F_{.99}(1,35) = 7.415$

Regression Coefficient: (Pooled within-class)

$$b = E_{xy}/E_{xx} = 0.067$$

Adjusted Treatment Means

$\overline{Y}'_1 = \overline{Y}_1 - b(\overline{X}_1 - \overline{X}) = 87.1 - .067(44.52 - 46.65) = 87.234$

$Y'_2 = Y_2 - b(X_2 - X) = 78.31 - .067(48.78 - 46.65) = 78.175$

Test on Assumption of Homogeneity of Treatment and Regression Effects

$S_1 = E_{yy} - (E^2_{xy_1}/E_{xx_1} + E^2_{xy_2}/E_{xx_2}) = 2197.896 - 33.276$

$S_2 = (E^2_{xy_1}/E_{xx_1} + E^2_{xy_2}/E_{xx_2}) - E^2_{xy}/E_{xx} = 33.276 - 9.371 = 2164.62$

$$F_{obs} = \frac{S_2/(k-1)}{S_1/k(n-2)} = \frac{23.905}{63.665} = 0.375^{**}$$

**F < 1 is always non-significant

EXHIBIT F

COMPUTATIONAL DATA FOR ANALYSIS OF COVARIANCE FOR THE STUDENT TEACHER RATING SCALE: SEMESTER

$n_1 = 19$ $n_2 = 19$ $N = 38$

$T_{X_1} = 846$ $T_{X_1} = 927$ $\sum X_1^2 = 38778$ $\sum X_2^2 = 46187$

$T_{Y_1} = 3284$ $T_{Y_2} = 2996$ $\sum Y_1^2 = 57193$ $\sum Y_2^2 = 478574$

$\sum XY_1 = 146378$ $\sum XY_2 = 146289$

$\overline{X}_1 = 44.52$ $\overline{X}_2 = 48.78$ $\overline{X} = 46.65$ $\overline{Y}_1 = 172.842$ $\overline{Y}_2 = 157.684$

$$S_{xx} = \sum(X)^2 - (T_{X_1} + T_{X_2})^2/N = 84965 - 82724.447 = 2240.553$$

$$S_{yy} = \sum(Y)^2 - (T_{Y_1} + T_{Y_2})^2/N = 1050510 - 1037852.631 = 12657.369$$

$$S_{xy} = \sum XY - (T_{X_1} + T_{X_2})(T_{Y_1} + T_{Y_2})/N = 292667 - 293011.578 = -344.578$$

$$E_{xx} = \sum(X)^2 - (T_{X_1}^2/n_1 + T_{X_2}^2/n_2) = 84965 - 82897.105 = 2067.895$$

$$E_{yy} = \sum(Y)^2 - (T_{Y_1}^2/n_1 + T_{Y_2}^2/n_2) = 1050510 - 1040035.367 = 10474.633$$

$$E_{xy} = \sum XY - (T_{X_1}T_{Y_1}/n_1 + T_{X_2}T_{Y_2}/n_2) = 292667 - 292397.684 = 269.316$$

Analysis of Variance

Source	SS	df	MS	F
Totals: S_{yy}	12657.369	kn-1=37		
Error: E_{yy}	10474.633	kn-2=36	E_{yy}/df=290.962	$\frac{MS_T}{MS_E} = 7.510$
Treatments: T_{yy}	2182.736	k-1= 1	T_{yy}/df=2182.736	

$$S'_{yy} = S_{yy} - S^2_{xy}/S_{xx} = 12657.369 - 52.993 = 12604.376$$

$$E'_{yy} = E_{yy} - E^2_{xy}/E_{xx} = 10474.633 - 35.074 = 10439.559$$

Analysis of Covariance

Source	SS	df	MS	F**
Totals: S'_{yy}	12604.376	kn-2 = 36		
Error: E'_{yy}	10439.559	(kn-2)-1=35	$E'_{yy}/df=298.273$	$\frac{MS_{TR}}{MS_{E'}} = 7.257$
Treatments: T_{yy_R}	2164.817	k-1=1	$T_{yy_R}/df=2164.817$	

$^{**}F_{.95}(1,35) = 4.12$

Regression Coefficient: (Pooled Within-Class)

$$b = E_{xy}/E_{xx} = \frac{269.316}{2067.895} = .13$$

Adjusted Treatment Means

$$\overline{Y}'_1 = \overline{Y}_1 - b(\overline{X}_1 - \overline{X}) = 172.84 - .13(-2) = 173.102$$

$$\overline{Y}'_2 = \overline{Y}_2 - b(\overline{X}_2 - \overline{X}) = 157.684 - .13(+2) = 157.424$$

Test on Assumption of Homogeneity of Treatment and Regression Effects

$$S_1 = E_{yy} - (E^2_{xy_1}/E_{xx_1} + E^2_{xy_2}/E_{xx_2}) = 10474.633 - 35.238 = 10439.395$$

$$S_2 = (E^2_{xy_1}/E_{xx_1} + E^2_{xy_2}/E_{xx_2}) - E^2_{xy}/E_{xx} = 35.238 - 35.074 = .164$$

$$F_{obs} = \frac{S_2/(k-1)}{S_1/k(n-2)} = \frac{.164}{307.041} = .0005342^{**}$$

$^{**}F < 1$ is always non-significant.

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